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RATES OF INTEREST AND THE PRICES OF INVESTMENT SECURITIES: 1890-1909

The following tables of the prices of bonds and of the interest yielded by investment securities, commercial paper, and call loans have been made in connection with an investigation into business cycles since 1890. They are companion pieces to the tables of relative prices of common and preferred stocks, published in the issues of this Journal for May and July, 1910. The text of the present paper is limited to a description of the tables, a brief analysis of the results, and a comparison between the course of interest rates and bond prices in America and Europe. While certain special problems suggested by the statistics are discussed, no systematic effort is made to account for the fluctuations in the rates of interest; for that general problem cannot be treated adequately without thorough analysis of the whole business situation.

I. THE TABLES OF INTEREST RATES

For long-time loans no market rates of interest are regularly quoted. A good substitute for such quotations, however, is afforded by the net rates of interest realized by investors who lend money to governments or business enterprises by purchasing bonds.

The number of bonds for which net yields can be computed by months since 1890 is small. The whole class of state and municipal bonds is barred out by lack of satisfactory quotations. National bonds, while quoted every month, are prevented from reflecting accurately general market conditions by the requirements of the National Banking Act. Moreover, there is no single type of United States bonds which has been upon the market during the whole period since 1890. It is only by treating the "4 per cents of 1925" as a continuation of the "4 per cents of 1907" that a continuous series can be approximated. Some arbitrary assumption is involved in grafting one of these series upon the other. The device used is to multiply the net yields of the 4's of 1907 in 1890-95, by 1.026—the ratio between the

yields of the two issues of 4's in 1896, which is the first full year that both were upon the market. This shift is more simple than accurate, and the composite series which it gives cannot be highly commended.¹ Fortunately, there remains one class of bonds for which better quotations are available.

The railway bonds now listed on the New York Stock Exchange number over 600; but of these, few date back to 1890 and have substantially complete quotations for every month since then. To be available, bonds must also have several years to run after 1909; for otherwise they are not now trustworthy indices of the interest rates which investors require on long loans. Indeed, only the ten securities described in Table I meet all requirements passably, and of these not all have been above suspicion as conservative investments during the whole period covered.

The lowest and highest prices of these bonds in each month of 1890-1909 were obtained from the *Financial Review*. The means between these extreme quotations were struck, after accrued interest, as of the middle of the month, had been deducted. Then net yields were computed for each month from these mean quotations by the aid of bond tables.² Finally, net yields by quarters and by years were computed by averaging the monthly figures.³ To show the variations in interest rates more clearly, columns of relative rates, computed on the basis average actual net yields in 1890-99=100, were added to the tables.⁴ Table II presents the results by years. The bonds are arranged in the order of their average net yields in 1890-99. The figures for

¹ See Table III. The net yields for different issues of United States bonds from 1878 to 1909 are given in A. Piatt Andrew's *Statistics for the United States* (National Monetary Commission, Senate Document, No. 570, 61st Cong., 2d sess.), p. 281.

² The computing was done by Donald English, sometime Assistant in Economics in the University of California. When a bond lacked a quotation for some month, its net yield was interpolated by supposing that this yield varied from the net yield of the preceding or following month in the same proportion that the average net yields of the remaining bonds varied. Interpolations were necessary, however, in but 47 of the 2,400 monthly figures—not quite 2 per cent of the cases.

³ Frequent discrepancies of one point may be found between the average net yields by quarters and by years. They are due to the carrying of fractions of .5 or more and the dropping of smaller fractions. Statistical offices often arbitrarily change averages so as to be formally consistent with the figures from which they are struck; but this practice is less accurate in substance, though more accurate in form, than the one followed here.

⁴ The average relative yields are computed on the index-number plan from the relative figures for each of the ten bonds—not from the average actual yields of all the bonds.

TABLE I
DESCRIPTION OF THE RAILWAY BONDS INCLUDED IN THE FOLLOWING TABLES

| NAME OF RAILWAY | NAME OF BONDS | MEDIUM OF PAY- MENT | DATES OF | | AMOUNT OF ISSUE IN MILLIONS OF DOLLARS | | | RATE OF INTEREST PER CENT | MOODY'S RATING IN 1909* |
|--|---|------------------------------|----------|---------------|--|------------------|------|------------------------------|----------------------------|
| | | | Issue | Matu- rity | Autho- rized | Outstand- ing | | | |
| | | | | | | 1890 | 1909 | | |
| Chicago & East- ern Illinois..... | General consoli- dated and first mortgage | | 1887 | 1937 | 30 | 4 | 20 | 5 | A a |
| Missouri, Kansas & Texas..... | First mortgage | Gold | 1890 | 1990 | 40 | 39 | 40 | 4 | A a |
| Wabash..... | First mortgage | Gold | 1889 | 1939 | 34 | 23 | 34 | 5 | A a a |
| Chesapeake and Ohio..... | First consoli- dated mort- gage | | | | | | | | |
| | | Gold | 1889 | 1939 | 30 | 22 | 28 | 5 | A a |
| Chicago, St. Paul, Minnea- polis & Omaha | Consolidated mortgage | | 1880 | 1930 | 30 | 13 | 16 | 6 | A a a |
| Chicago, Burl- ington & Quincy..... | Nebraska Ex- tension bonds, secured by de- posit of first mortgage bonds of Nebraska branch roads | | 1887 | 1927 | † | 25 | 23 | 4 | A a a |
| Central Railroad of New Jersey. | General mort- gage | Gold | 1887 | 1987 | 50 | 35 | 45 | 5 | A a a |
| Chicago, Mil- waukee & St. Paul..... | General Mort- gage "Series A" | Gold | 1889 | 1989 | 150 | 9 | 49 | 4 | A a a |
| New York, Chi- cago & St. Louis..... | First mortgage | Gold | 1887 | 1937 | 20 | 20 | 19 | 4 | A a a |
| West Shore Rail- road..... | First mortgage, guaranteed by the New York Central | | 1885 | 2361 | 50 | 50 | 50 | 4 | A a a |

† \$20,000 per mile.

* From Moody's *Analysis of Railroad Investments* (New York, 1909). Moody recognizes 14 classes of securities, of which A a a and A are the highest.

TABLE II

ACTUAL AND RELATIVE RATES OF INTEREST YIELDED BY INVESTMENTS IN TEN
AMERICAN RAILWAY BONDS BY YEARS, 1890-1909: ACTUAL RATES

| | C.& E. I. | M.K. & T. | WA- BASH | C.& O. | C.St. P.M. & O. | C.B. & Q. | C.R. R.OF N.J. | C.M. & St. P. | N.Y. C.& St.L. | W.S. R.R. | AVERAGES | | |
|---------|--------------|--------------|-------------|--------|-----------------------|--------------|----------------------|---------------------|----------------------|--------------|---------------|----------------|------|
| | | | | | | | | | | | First Five | Second Five | All |
| | % | % | % | % | % | % | % | % | % | % | % | % | % |
| 1890... | 5.24 | 5.20 | 4.99 | 5.09 | 4.96 | 4.53 | 4.55 | 4.39 | 4.38 | 3.88 | 5.10 | 4.35 | 4.72 |
| 1891... | 5.28 | 5.25 | 5.06 | 5.11 | 5.06 | 4.92 | 4.61 | 4.79 | 4.42 | 3.96 | 5.15 | 4.54 | 4.85 |
| 1892... | 5.03 | 5.04 | 4.81 | 4.85 | 4.84 | 4.73 | 4.53 | 4.49 | 4.18 | 3.90 | 4.91 | 4.37 | 4.64 |
| 1893... | 5.16 | 5.17 | 4.95 | 5.00 | 4.97 | 4.94 | 4.60 | 4.42 | 4.30 | 4.02 | 5.05 | 4.46 | 4.75 |
| 1894... | 5.14 | 5.04 | 4.83 | 4.75 | 4.63 | 4.72 | 4.40 | 4.46 | 4.04 | 3.87 | 4.88 | 4.30 | 4.59 |
| 1895... | 5.07 | 4.76 | 4.72 | 4.59 | 4.56 | 4.64 | 4.36 | 4.38 | 3.87 | 3.82 | 4.74 | 4.21 | 4.48 |
| 1896... | 5.12 | 4.92 | 4.80 | 4.72 | 4.65 | 4.80 | 4.34 | 4.28 | 3.80 | 3.85 | 4.84 | 4.23 | 4.54 |
| 1897... | 5.02 | 4.78 | 4.76 | 4.48 | 4.28 | 4.51 | 4.47 | 3.96 | 3.78 | 3.72 | 4.66 | 4.00 | 4.38 |
| 1898... | 4.71 | 4.57 | 4.54 | 4.29 | 4.12 | 4.07 | 4.46 | 3.83 | 3.80 | 3.69 | 4.45 | 3.97 | 4.21 |
| 1899... | 4.32 | 4.34 | 4.26 | 4.12 | 3.97 | 3.47 | 4.23 | 3.59 | 3.71 | 3.56 | 4.20 | 3.71 | 3.96 |
| 1900... | 4.27 | 4.40 | 4.20 | 4.12 | 4.09 | 3.42 | 4.07 | 3.61 | 3.71 | 3.57 | 4.22 | 3.68 | 3.05 |
| 1901... | 3.90 | 4.11 | 4.08 | 4.00 | 3.83 | 3.40 | 3.81 | 3.59 | 3.66 | 3.54 | 3.98 | 3.60 | 3.79 |
| 1902... | 3.84 | 4.05 | 4.07 | 4.01 | 3.81 | 3.50 | 3.63 | 3.51 | 3.73 | 3.55 | 3.96 | 3.58 | 3.77 |
| 1903... | 4.15 | 4.13 | 4.24 | 4.19 | 4.09 | 3.69 | 3.84 | 3.70 | 3.80 | 3.70 | 4.16 | 3.76 | 3.96 |
| 1904... | 4.10 | 4.06 | 4.15 | 4.12 | 4.03 | 3.72 | 3.78 | 3.68 | 3.83 | 3.72 | 4.09 | 3.75 | 3.92 |
| 1905... | 3.95 | 3.97 | 4.08 | 4.04 | 3.79 | 3.61 | 3.69 | 3.59 | 3.70 | 3.70 | 3.97 | 3.68 | 3.82 |
| 1906... | 4.06 | 4.03 | 4.24 | 4.10 | 3.97 | 3.78 | 3.89 | 3.71 | 3.82 | 3.80 | 4.08 | 3.80 | 3.94 |
| 1907... | 4.44 | 4.24 | 4.60 | 4.45 | 4.27 | 4.08 | 4.11 | 3.95 | 4.07 | 3.97 | 4.40 | 4.04 | 4.22 |
| 1908... | 4.33 | 4.15 | 4.63 | 4.32 | 4.18 | 4.04 | 4.04 | 3.93 | 4.04 | 3.95 | 4.32 | 4.00 | 4.16 |
| 1909... | 4.14 | 4.01 | 4.24 | 4.13 | 3.95 | 3.94 | 3.89 | 3.87 | 3.94 | 3.89 | 4.09 | 3.91 | 4.00 |

RELATIVE RATES

Average Actual Yields in 1890-99 = 100

| | C.& E. I. | M.K. & T. | WA- BASH | C.& O. | C.St. P.M. & O. | C.B. & Q. | C.R. R.OF N.J. | C.M. & St. P. | N.Y. C.& St.L. | W.S. R.R. | AVERAGES | | |
|--|--------------|--------------|-------------|--------|-----------------------|--------------|----------------------|---------------------|----------------------|--------------|---------------|----------------|-----|
| | | | | | | | | | | | First Five | Second Five | All |
| Average Actual Yields 1890-99 | 5.01 | 4.91 | 4.77 | 4.70 | 4.60 | 4.53 | 4.46 | 4.26 | 4.04 | 3.83 | | | |
| 1890... | 105 | 106 | 105 | 108 | 108 | 100 | 102 | 103 | 108 | 101 | 106 | 103 | 105 |
| 1891... | 105 | 107 | 106 | 109 | 110 | 109 | 103 | 112 | 109 | 103 | 107 | 107 | 107 |
| 1892... | 100 | 103 | 101 | 103 | 105 | 104 | 102 | 105 | 104 | 102 | 103 | 103 | 103 |
| 1893... | 103 | 105 | 104 | 106 | 108 | 109 | 103 | 104 | 107 | 105 | 105 | 106 | 105 |
| 1894... | 103 | 103 | 101 | 101 | 101 | 104 | 99 | 105 | 100 | 101 | 102 | 102 | 102 |
| 1895... | 101 | 97 | 99 | 98 | 99 | 102 | 98 | 103 | 96 | 100 | 99 | 100 | 99 |
| 1896... | 102 | 100 | 101 | 100 | 101 | 106 | 97 | 100 | 96 | 101 | 101 | 100 | 100 |
| 1897... | 100 | 97 | 100 | 95 | 93 | 99 | 100 | 93 | 94 | 97 | 97 | 97 | 97 |
| 1898... | 94 | 93 | 95 | 91 | 89 | 90 | 100 | 90 | 94 | 96 | 92 | 94 | 93 |
| 1899... | 86 | 88 | 89 | 88 | 86 | 77 | 95 | 84 | 92 | 93 | 87 | 88 | 88 |
| 1900... | 85 | 90 | 88 | 88 | 89 | 75 | 91 | 85 | 92 | 93 | 88 | 87 | 88 |
| 1901... | 78 | 84 | 86 | 85 | 83 | 75 | 86 | 84 | 91 | 93 | 83 | 86 | 85 |
| 1902... | 77 | 83 | 85 | 85 | 83 | 77 | 81 | 82 | 92 | 93 | 83 | 85 | 84 |
| 1903... | 83 | 84 | 89 | 89 | 89 | 81 | 86 | 87 | 96 | 97 | 87 | 89 | 88 |
| 1904... | 82 | 83 | 87 | 88 | 88 | 82 | 85 | 86 | 95 | 97 | 86 | 89 | 87 |
| 1905... | 79 | 81 | 86 | 86 | 82 | 80 | 83 | 84 | 94 | 97 | 83 | 88 | 85 |
| 1906... | 81 | 82 | 89 | 87 | 86 | 83 | 87 | 87 | 95 | 99 | 85 | 90 | 88 |
| 1907... | 89 | 86 | 96 | 95 | 93 | 90 | 92 | 93 | 101 | 104 | 92 | 96 | 94 |
| 1908... | 86 | 85 | 97 | 92 | 91 | 89 | 91 | 92 | 100 | 103 | 90 | 95 | 93 |
| 1909... | 83 | 82 | 89 | 88 | 86 | 87 | 87 | 91 | 98 | 102 | 86 | 93 | 89 |

quarters and months are given in Tables IV and V. Since the latter tables would be made unduly bulky by printing the full figures for all the securities, only two bond series are included:

the general average, and the series for one issue which merits especial attention.

The best American records of short-time interest rates are the tables for New York, likewise published in the *Financial Review*. These tables show by weeks the rates (1) for call loans at the Stock Exchange and at the banks and trust companies, (2) for seven kinds of time loans, ranging from 30 days to 7 months, and (3) for three descriptions of commercial paper. Of call rates, those quoted at the Stock Exchange are both the most important and the most regularly recorded. The record for commercial paper is not quite complete; for during the height of crises there are sometimes weeks in which no rate is quoted, or in which the quoted rates are said to be merely nominal. But the figures for time loans present even more lacunae. Accordingly, the data selected are (1) the average rates for call loans at the Stock Exchange, (2) the rates for choice double-name commercial paper running 60 to 90 days, and (3) the rates for prime single-name commercial paper running 4 to 6 months.

TABLE III

ACTUAL AND RELATIVE RATES OF INTEREST ON BONDS, COMMERCIAL PAPER, AND CALL LOANS IN NEW YORK BY YEARS, 1890-1909

| | ACTUAL RATES OF INTEREST | | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99=100 | | | | | |
|-----------|----------------------------------|-----------------------|-------------------------------|-------------|---------------|---|--|-----------------------|-------------------------------|-------------|---------------|---|
| | Bonds | | | Com. Paper | | Call Loans at Stock Ex- change | Bonds | | | Com. Paper | | Call Loans at Stock Ex- change |
| | U.S. 4's of 1907 & 1925 | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | U.S. 4's of 1907 & 1925 | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | |
| 1890..... | 2.43 | 3.88 | 4.72 | 6.80 | 5.64 | 5.81 | 88 | 101 | 105 | 115 | 123 | 176 |
| 1891..... | 2.65 | 3.96 | 4.85 | 6.50 | 5.41 | 3.42 | 96 | 103 | 107 | 109 | 118 | 104 |
| 1892..... | 2.80 | 3.90 | 4.64 | 5.38 | 4.04 | 3.03 | 101 | 102 | 103 | 90 | 88 | 92 |
| 1893..... | 3.04 | 4.02 | 4.75 | 7.62 | 6.86 | 4.58 | 110 | 105 | 105 | 127 | 150 | 139 |
| 1894..... | 2.70 | 3.87 | 4.59 | 5.22 | 3.04 | 1.06 | 101 | 101 | 102 | 87 | 66 | 32 |
| 1895..... | 2.80 | 3.82 | 4.48 | 5.73 | 3.64 | 1.85 | 105 | 100 | 99 | 96 | 79 | 56 |
| 1896..... | 3.14 | 3.85 | 4.54 | 7.02 | 5.76 | 4.21 | 114 | 101 | 100 | 117 | 126 | 128 |
| 1897..... | 2.73 | 3.72 | 4.38 | 4.72 | 3.57 | 1.77 | 90 | 97 | 97 | 79 | 78 | 54 |
| 1898..... | 2.60 | 3.69 | 4.21 | 5.31 | 3.82 | 2.16 | 97 | 96 | 93 | 89 | 83 | 66 |
| 1899..... | 2.47 | 3.56 | 3.96 | 5.48 | 4.05 | 5.04 | 80 | 93 | 88 | 92 | 88 | 153 |
| 1900..... | 2.18 | 3.57 | 3.95 | 5.71 | 4.38 | 2.03 | 79 | 93 | 88 | 95 | 96 | 89 |
| 1901..... | 1.97 | 3.54 | 3.79 | 5.41 | 4.24 | 3.98 | 71 | 93 | 85 | 90 | 93 | 121 |
| 1902..... | 1.88 | 3.55 | 3.77 | 5.75 | 4.88 | 5.22 | 72 | 93 | 84 | 96 | 106 | 150 |
| 1903..... | 1.99 | 3.70 | 3.96 | 6.21 | 5.43 | 3.79 | 72 | 97 | 88 | 104 | 118 | 115 |
| 1904..... | 2.09 | 3.72 | 3.92 | 5.13 | 4.24 | 1.78 | 76 | 97 | 87 | 86 | 93 | 54 |
| 1905..... | 2.00 | 3.70 | 3.82 | 5.17 | 4.35 | 4.39 | 72 | 97 | 85 | 86 | 95 | 133 |
| 1906..... | 2.04 | 3.80 | 3.94 | 6.24 | 5.68 | 6.44 | 74 | 99 | 88 | 104 | 124 | 196 |
| 1907..... | 2.18 | 3.97 | 4.22 | 6.55 | 6.27 | 7.27 | 79 | 104 | 94 | 109 | 137 | 221 |
| 1908..... | 2.44 | 3.95 | 4.16 | 4.95 | 4.42 | 1.97 | 88 | 103 | 93 | 83 | 96 | 60 |
| 1909..... | 2.52 | 3.89 | 4.00 | 4.67 | 3.86 | 2.70 | 91 | 102 | 89 | 78 | 84 | 82 |

TABLE IV

RATES OF INTEREST ON BONDS, COMMERCIAL PAPER, AND CALL LOANS IN NEW YORK
BY QUARTERS, 1890-1909

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 =100 | | | | | |
|-----------------------|--------------------------|----------------------|------------------|------------|------------------------------|--|----------------------|------------------|------------|------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1890—1st quarter..... | 3.83 | 4.65 | 6.44 | 5.30 | 5.58 | 100 | 103 | 108 | 116 | 160 | |
| 2d quarter..... | 3.84 | 4.64 | 6.45 | 5.07 | 4.62 | 100 | 103 | 108 | 111 | 140 | |
| 3d quarter..... | 3.87 | 4.72 | 6.48 | 5.47 | 7.42 | 101 | 105 | 108 | 119 | 225 | |
| 4th quarter..... | 3.08 | 4.87 | 8.17 | 6.98 | 5.62 | 104 | 108 | 136 | 152 | 171 | |
| 1891—1st quarter..... | 3.03 | 4.83 | 6.76 | 5.41 | 3.27 | 103 | 107 | 113 | 118 | 90 | |
| 2d quarter..... | 3.06 | 4.88 | 6.40 | 5.26 | 3.62 | 103 | 108 | 107 | 115 | 110 | |
| 3d quarter..... | 3.00 | 4.89 | 6.64 | 5.72 | 3.00 | 104 | 108 | 111 | 125 | 91 | |
| 4th quarter..... | 3.07 | 4.78 | 6.14 | 5.18 | 3.85 | 104 | 106 | 103 | 113 | 117 | |
| 1892—1st quarter..... | 3.00 | 4.65 | 5.27 | 3.07 | 2.14 | 102 | 103 | 88 | 87 | 65 | |
| 2d quarter..... | 3.88 | 4.60 | 4.58 | 3.14 | 1.62 | 101 | 102 | 77 | 60 | 49 | |
| 3d quarter..... | 3.00 | 4.64 | 5.45 | 3.09 | 2.63 | 102 | 103 | 91 | 87 | 80 | |
| 4th quarter..... | 3.02 | 4.67 | 6.26 | 5.10 | 5.81 | 102 | 103 | 105 | 113 | 176 | |
| 1893—1st quarter..... | 3.05 | 4.62 | 6.33 | 5.84 | 5.31 | 103 | 103 | 106 | 127 | 161 | |
| 2d quarter..... | 4.03 | 4.71 | 8.10 | 7.02 | 5.62 | 105 | 105 | 135 | 153 | 171 | |
| 3d quarter..... | 4.15 | 4.97 | 9.84 | 9.33 | 5.65 | 108 | 110 | 164 | 204 | 172 | |
| 4th quarter..... | 3.06 | 4.71 | 6.20 | 4.68 | 1.74 | 103 | 104 | 105 | 102 | 53 | |
| 1894—1st quarter..... | 3.01 | 4.64 | 5.17 | 3.30 | 1.04 | 102 | 103 | 86 | 72 | 32 | |
| 2d quarter..... | 3.87 | 4.57 | 4.83 | 2.96 | 1.08 | 101 | 101 | 81 | 65 | 33 | |
| 3d quarter..... | 3.87 | 4.59 | 5.13 | 3.15 | 1.00 | 101 | 102 | 86 | 69 | 30 | |
| 4th quarter..... | 3.83 | 4.55 | 5.75 | 2.80 | 1.14 | 100 | 101 | 96 | 61 | 35 | |
| 1895—1st quarter..... | 3.84 | 4.62 | 6.35 | 3.41 | 1.67 | 100 | 102 | 106 | 74 | 51 | |
| 2d quarter..... | 3.83 | 4.49 | 5.12 | 3.03 | 1.56 | 100 | 100 | 86 | 66 | 47 | |
| 3d quarter..... | 3.79 | 4.37 | 5.37 | 3.50 | 1.34 | 99 | 97 | 90 | 78 | 41 | |
| 4th quarter..... | 3.81 | 4.43 | 6.35 | 4.51 | 2.85 | 100 | 98 | 106 | 98 | 87 | |
| 1896—1st quarter..... | 3.81 | 4.48 | 7.60 | 5.57 | 4.17 | 100 | 99 | 128 | 122 | 127 | |
| 2d quarter..... | 3.82 | 4.45 | 5.94 | 4.72 | 2.54 | 100 | 99 | 99 | 103 | 77 | |
| 3d quarter..... | 3.92 | 4.67 | 7.80 | 7.05 | 4.02 | 102 | 103 | 132 | 154 | 122 | |
| 4th quarter..... | 3.85 | 4.54 | 6.50 | 5.79 | 6.10 | 101 | 100 | 109 | 120 | 185 | |
| 1897—1st quarter..... | 3.77 | 4.43 | 4.56 | 3.26 | 1.67 | 99 | 98 | 76 | 71 | 51 | |
| 2d quarter..... | 3.72 | 4.43 | 4.54 | 3.39 | 1.36 | 97 | 98 | 76 | 74 | 41 | |
| 3d quarter..... | 3.70 | 4.34 | 4.83 | 3.79 | 1.61 | 97 | 96 | 81 | 83 | 49 | |
| 4th quarter..... | 3.68 | 4.31 | 4.96 | 3.74 | 2.45 | 99 | 95 | 83 | 82 | 74 | |
| 1898—1st quarter..... | 3.68 | 4.23 | 5.17 | 3.93 | 2.15 | 96 | 94 | 86 | 86 | 65 | |
| 2d quarter..... | 3.78 | 4.30 | 6.11 | 4.29 | 2.05 | 99 | 95 | 102 | 94 | 62 | |
| 3d quarter..... | 3.68 | 4.18 | 5.23 | 3.81 | 2.20 | 96 | 93 | 87 | 83 | 67 | |
| 4th quarter..... | 3.64 | 4.13 | 4.79 | 3.27 | 2.24 | 95 | 92 | 80 | 71 | 68 | |
| 1899—1st quarter..... | 3.58 | 4.00 | 4.77 | 3.25 | 3.17 | 94 | 89 | 80 | 71 | 96 | |
| 2d quarter..... | 3.53 | 3.92 | 4.85 | 3.53 | 3.74 | 92 | 87 | 81 | 77 | 114 | |
| 3d quarter..... | 3.53 | 3.91 | 5.66 | 4.24 | 4.60 | 92 | 87 | 95 | 93 | 140 | |
| 4th quarter..... | 3.59 | 4.00 | 6.86 | 5.41 | 8.05 | 94 | 89 | 115 | 118 | 263 | |
| 1900—1st quarter..... | 3.56 | 3.97 | 6.27 | 4.71 | 3.50 | 93 | 88 | 105 | 103 | 106 | |
| 2d quarter..... | 3.56 | 3.94 | 5.31 | 3.83 | 2.23 | 93 | 87 | 89 | 84 | 68 | |
| 3d quarter..... | 3.59 | 3.97 | 5.48 | 4.20 | 1.47 | 94 | 88 | 92 | 92 | 45 | |
| 4th quarter..... | 3.56 | 3.91 | 5.77 | 4.75 | 4.51 | 93 | 87 | 96 | 104 | 137 | |
| 1901—1st quarter..... | 3.49 | 3.79 | 5.14 | 3.88 | 2.52 | 91 | 84 | 86 | 85 | 77 | |
| 2d quarter..... | 3.54 | 3.78 | 5.40 | 3.95 | 5.10 | 93 | 84 | 90 | 86 | 155 | |
| 3d quarter..... | 3.50 | 3.81 | 5.62 | 4.52 | 3.74 | 93 | 85 | 94 | 99 | 114 | |
| 4th quarter..... | 3.57 | 3.79 | 5.44 | 4.73 | 4.58 | 93 | 84 | 91 | 103 | 130 | |
| 1902—1st quarter..... | 3.56 | 3.75 | 5.44 | 4.38 | 3.70 | 93 | 84 | 91 | 96 | 112 | |
| 2d quarter..... | 3.54 | 3.73 | 5.37 | 4.50 | 4.55 | 93 | 83 | 90 | 98 | 138 | |
| 3d quarter..... | 3.52 | 3.77 | 5.81 | 4.96 | 6.19 | 92 | 84 | 97 | 108 | 188 | |
| 4th quarter..... | 3.58 | 3.83 | 6.58 | 5.84 | 6.44 | 94 | 85 | 110 | 127 | 196 | |
| 1903—1st quarter..... | 3.03 | 3.87 | 5.81 | 5.25 | 5.02 | 95 | 86 | 97 | 115 | 152 | |
| 2d quarter..... | 3.09 | 3.95 | 5.79 | 5.00 | 3.21 | 96 | 88 | 97 | 109 | 97 | |
| 3d quarter..... | 3.72 | 4.05 | 6.54 | 5.73 | 2.29 | 97 | 90 | 109 | 125 | 70 | |
| 4th quarter..... | 3.76 | 3.99 | 6.54 | 5.83 | 4.54 | 98 | 89 | 109 | 127 | 138 | |

TABLE IV—*Concluded*

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 = 100 | | | | | |
|-----------------------|--------------------------|----------------------|------------------|------------|-------------------------------|---|----------------------|------------------|------------|-------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1904—1st quarter..... | 3.72 | 3.97 | 5.61 | 4.77 | 1.95 | 97 | 88 | 94 | 104 | 59 | |
| 2d quarter..... | 3.74 | 3.96 | 4.71 | 3.90 | 1.37 | 98 | 88 | 79 | 85 | 42 | |
| 3d quarter..... | 3.72 | 3.89 | 4.90 | 3.93 | 1.13 | 97 | 87 | 82 | 86 | 34 | |
| 4th quarter..... | 3.71 | 3.86 | 5.31 | 4.27 | 2.66 | 97 | 86 | 89 | 93 | 81 | |
| 1905—1st quarter..... | 3.69 | 3.82 | 4.73 | 3.91 | 2.60 | 96 | 85 | 79 | 85 | 79 | |
| 2d quarter..... | 3.71 | 3.82 | 4.75 | 3.91 | 2.70 | 97 | 85 | 79 | 85 | 82 | |
| 3d quarter..... | 3.69 | 3.81 | 5.06 | 4.34 | 2.60 | 96 | 85 | 85 | 95 | 79 | |
| 4th quarter..... | 3.72 | 3.84 | 6.17 | 5.44 | 9.67 | 97 | 85 | 103 | 119 | 204 | |
| 1906—1st quarter..... | 3.74 | 3.87 | 5.81 | 5.13 | 6.25 | 98 | 86 | 97 | 112 | 190 | |
| 2d quarter..... | 3.79 | 3.93 | 5.82 | 5.34 | 5.52 | 99 | 88 | 97 | 117 | 168 | |
| 3d quarter..... | 3.82 | 3.97 | 6.52 | 5.97 | 5.39 | 100 | 88 | 109 | 130 | 164 | |
| 4th quarter..... | 3.84 | 3.99 | 6.77 | 6.27 | 8.59 | 100 | 89 | 113 | 137 | 261 | |
| 1907—1st quarter..... | 3.88 | 4.05 | 6.70 | 6.10 | 5.67 | 101 | 90 | 112 | 133 | 172 | |
| 2d quarter..... | 3.91 | 4.15 | 6.14 | 5.67 | 2.58 | 102 | 92 | 103 | 124 | 78 | |
| 3d quarter..... | 3.98 | 4.22 | 6.70 | 6.24 | 3.92 | 104 | 94 | 112 | 136 | 119 | |
| 4th quarter..... | 4.13 | 4.45 | 7.33 | 7.46 | 16.20 | 108 | 99 | 122 | 163 | 492 | |
| 1908—1st quarter..... | 3.99 | 4.26 | 6.25 | 5.75 | 2.87 | 104 | 95 | 104 | 125 | 87 | |
| 2d quarter..... | 3.98 | 4.20 | 4.70 | 4.00 | 1.62 | 104 | 93 | 79 | 87 | 49 | |
| 3d quarter..... | 3.92 | 4.14 | 4.58 | 3.75 | 1.22 | 102 | 92 | 77 | 82 | 37 | |
| 4th quarter..... | 3.92 | 4.06 | 4.69 | 3.97 | 2.10 | 102 | 90 | 78 | 87 | 64 | |
| 1909—1st quarter..... | 3.86 | 3.97 | 4.28 | 3.56 | 1.96 | 101 | 89 | 71 | 78 | 60 | |
| 2d quarter..... | 3.89 | 3.98 | 4.25 | 3.38 | 1.88 | 102 | 89 | 71 | 74 | 57 | |
| 3d quarter..... | 3.91 | 4.00 | 4.41 | 3.86 | 2.30 | 102 | 89 | 74 | 84 | 70 | |
| 4th quarter..... | 3.90 | 4.05 | 5.81 | 5.07 | 4.66 | 102 | 90 | 97 | 111 | 141 | |

In reducing the weekly rates given in the source to monthly averages, each week was placed in that month in which fell the majority of its days. Both the high and the low figures were included in making the averages.⁵ Relative rates were computed on the same plan as the relative rates for bonds—that is, on the basis of average actual rates in 1890-99=100. For convenience of comparison, the results are presented in Tables III, IV, and V, side by side with the net yields of bonds.⁶

⁵ The averages by quarters and by years were not computed from the monthly figures, but directly from the original figures by weeks. Of course this is the more accurate method, although it permits many formal discrepancies to appear between the quarterly or annual figures as entered in the tables, and the corresponding figures which may be computed from the rates by months.

⁶ In his *Rate of Interest*, Professor Irving Fisher gives the yearly average rate of interest in New York upon "prime two-name 60-day" paper, computed from the *Financial Review* "by averaging the highest and lowest weekly rates" (pp. 419, 420). There are numerous small discrepancies between his results and those of this investigation, for which it is difficult to account. The present figures have been checked by three computers and should be arithmetically correct.

TABLE V

RATES OF INTEREST ON BONDS, COMMERCIAL PAPER, AND CALL LOANS IN NEW YORK
BY MONTHS, 1890-1909

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 =100 | | | | | |
|---------------|--------------------------|----------------------|------------------|------------|------------------------------|--|----------------------|------------------|------------|------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1890—Jan..... | 3.83 | 4.62 | 6.45 | 5.39 | 7.70 | 100 | 102 | 108 | 118 | 234 | |
| Feb..... | 3.82 | 4.65 | 6.13 | 5.04 | 4.25 | 100 | 103 | 102 | 110 | 129 | |
| Mar..... | 3.83 | 4.67 | 6.75 | 5.50 | 4.25 | 100 | 104 | 113 | 120 | 120 | |
| Apr..... | 3.84 | 4.64 | 6.65 | 5.14 | 4.30 | 100 | 103 | 111 | 112 | 131 | |
| May..... | 3.84 | 4.63 | 6.38 | 5.06 | 4.88 | 100 | 103 | 107 | 110 | 148 | |
| June..... | 3.83 | 4.65 | 6.28 | 5.00 | 4.75 | 100 | 103 | 105 | 109 | 144 | |
| July..... | 3.85 | 4.68 | 6.25 | 5.08 | 4.60 | 101 | 104 | 104 | 111 | 140 | |
| Aug..... | 3.88 | 4.73 | 6.50 | 5.61 | 11.63 | 101 | 105 | 109 | 122 | 353 | |
| Sept..... | 3.88 | 4.76 | 6.75 | 5.71 | 6.75 | 101 | 106 | 113 | 125 | 205 | |
| Oct..... | 3.91 | 4.76 | 7.25 | 5.89 | 5.00 | 102 | 106 | 121 | 129 | 152 | |
| Nov..... | 3.99 | 4.88 | 8.88 | 8.20 | 7.00 | 104 | 108 | 148 | 179 | 213 | |
| Dec..... | 4.04 | 4.96 | 8.63 | 7.38 | 5.00 | 106 | 110 | 144 | 161 | 152 | |
| 1891—Jan..... | 3.94 | 4.83 | 7.28 | 5.83 | 3.90 | 103 | 107 | 122 | 127 | 118 | |
| Feb..... | 3.92 | 4.81 | 6.38 | 5.00 | 2.88 | 102 | 106 | 107 | 109 | 87 | |
| Mar..... | 3.94 | 4.86 | 6.50 | 5.25 | 2.88 | 103 | 108 | 100 | 115 | 87 | |
| Apr..... | 3.94 | 4.84 | 6.25 | 5.09 | 3.30 | 103 | 107 | 104 | 111 | 100 | |
| May..... | 3.96 | 4.87 | 6.50 | 5.33 | 4.38 | 103 | 108 | 100 | 116 | 133 | |
| June..... | 3.99 | 4.93 | 6.50 | 5.50 | 3.25 | 104 | 109 | 109 | 120 | 99 | |
| July..... | 4.01 | 4.93 | 6.60 | 5.63 | 2.20 | 105 | 109 | 110 | 123 | 67 | |
| Aug..... | 4.00 | 4.89 | 6.75 | 5.75 | 2.13 | 105 | 109 | 113 | 125 | 65 | |
| Sept..... | 3.95 | 4.84 | 6.60 | 5.79 | 4.50 | 103 | 107 | 110 | 126 | 137 | |
| Oct..... | 3.99 | 4.82 | 6.41 | 5.60 | 4.25 | 104 | 107 | 107 | 122 | 129 | |
| Nov..... | 3.98 | 4.80 | 6.25 | 5.10 | 4.38 | 104 | 106 | 104 | 111 | 133 | |
| Dec..... | 3.95 | 4.73 | 5.75 | 4.85 | 2.94 | 103 | 105 | 96 | 106 | 89 | |
| 1892—Jan..... | 3.99 | 4.66 | 5.45 | 4.17 | 2.40 | 102 | 103 | 91 | 91 | 73 | |
| Feb..... | 3.89 | 4.64 | 4.94 | 3.69 | 2.00 | 102 | 103 | 83 | 80 | 61 | |
| Mar..... | 3.90 | 4.65 | 5.35 | 3.96 | 2.00 | 102 | 103 | 80 | 86 | 61 | |
| Apr..... | 3.90 | 4.63 | 4.81 | 3.45 | 2.00 | 102 | 103 | 80 | 75 | 61 | |
| May..... | 3.87 | 4.59 | 4.56 | 3.18 | 1.50 | 101 | 102 | 76 | 69 | 46 | |
| June..... | 3.86 | 4.59 | 4.40 | 2.94 | 1.40 | 101 | 102 | 74 | 64 | 43 | |
| July..... | 3.89 | 4.62 | 5.13 | 3.43 | 1.88 | 102 | 102 | 86 | 75 | 57 | |
| Aug..... | 3.89 | 4.63 | 5.28 | 4.00 | 2.05 | 102 | 103 | 88 | 87 | 62 | |
| Sept..... | 3.92 | 4.67 | 6.07 | 4.75 | 4.13 | 102 | 103 | 101 | 104 | 123 | |
| Oct..... | 3.93 | 4.65 | 6.44 | 5.11 | 5.63 | 103 | 103 | 108 | 111 | 171 | |
| Nov..... | 3.90 | 4.66 | 6.00 | 5.11 | 5.15 | 102 | 104 | 100 | 111 | 156 | |
| Dec..... | 3.92 | 4.69 | 6.38 | 5.50 | 6.81 | 102 | 104 | 107 | 120 | 207 | |
| 1893—Jan..... | 3.94 | 4.64 | 6.06 | 5.18 | 4.00 | 103 | 103 | 101 | 113 | 121 | |
| Feb..... | 3.93 | 4.60 | 6.00 | 4.85 | 3.00 | 103 | 102 | 100 | 106 | 91 | |
| Mar..... | 3.97 | 4.64 | 6.80 | 6.80 | 8.20 | 104 | 103 | 114 | 148 | 249 | |
| Apr..... | 4.02 | 4.64 | 6.13 | 5.75 | 4.88 | 105 | 103 | 102 | 125 | 148 | |
| May..... | 4.03 | 4.71 | 8.35 | 6.65 | 3.60 | 105 | 105 | 139 | 145 | 109 | |
| June..... | 4.05 | 4.78 | 9.75 | 8.75 | 8.88 | 106 | 106 | 103 | 190 | 270 | |
| July..... | 4.14 | 4.93 | 9.75 | 9.75 | 7.75 | 108 | 109 | 103 | 213 | 235 | |
| Aug..... | 4.21 | 5.07 | 9.70 | 9.70 | 5.50 | 110 | 112 | 102 | 212 | 107 | |
| Sept..... | 4.11 | 4.89 | 10.14 | 8.32 | 3.75 | 107 | 108 | 109 | 182 | 114 | |
| Oct..... | 4.02 | 4.80 | 7.69 | 5.96 | 2.38 | 105 | 106 | 128 | 130 | 72 | |
| Nov..... | 3.93 | 4.67 | 5.80 | 4.47 | 1.70 | 103 | 104 | 97 | 98 | 52 | |
| Dec..... | 3.92 | 4.65 | 5.50 | 3.67 | 1.16 | 102 | 103 | 92 | 80 | 35 | |
| 1894—Jan..... | 3.94 | 4.68 | 5.35 | 3.50 | 1.02 | 103 | 104 | 80 | 76 | 31 | |
| Feb..... | 3.90 | 4.64 | 5.19 | 3.25 | 1.00 | 102 | 103 | 87 | 71 | 30 | |
| Mar..... | 3.88 | 4.59 | 4.94 | 3.00 | 1.09 | 101 | 102 | 83 | 65 | 33 | |
| Apr..... | 3.84 | 4.55 | 4.81 | 3.15 | 1.13 | 100 | 101 | 80 | 69 | 34 | |
| May..... | 3.88 | 4.56 | 4.75 | 2.91 | 1.10 | 101 | 101 | 79 | 63 | 33 | |

TABLE V—Continued

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 = 100 | | | | | |
|-----------|--------------------------|----------------------|------------------|------------|------------------------------|---|----------------------|------------------|------------|------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1894—June | 3.88 | 4.59 | 4.94 | 2.89 | 1.00 | 101 | 102 | 83 | 63 | 30 | |
| July | 3.88 | 4.62 | 4.94 | 3.00 | 1.00 | 101 | 103 | 83 | 65 | 30 | |
| Aug. | 3.87 | 4.60 | 4.98 | 3.09 | 1.00 | 101 | 102 | 83 | 67 | 30 | |
| Sept. | 3.86 | 4.57 | 5.50 | 3.28 | 1.00 | 101 | 101 | 92 | 72 | 30 | |
| Oct. | 3.84 | 4.55 | 5.75 | 2.72 | 1.00 | 101 | 101 | 96 | 59 | 30 | |
| Nov. | 3.82 | 4.53 | 5.75 | 2.81 | 1.03 | 100 | 100 | 96 | 61 | 31 | |
| Dec. | 3.83 | 4.56 | 5.75 | 2.88 | 1.44 | 100 | 101 | 96 | 63 | 44 | |
| 1895—Jan. | 3.83 | 4.58 | 5.80 | 3.00 | 1.35 | 100 | 101 | 98 | 65 | 41 | |
| Feb. | 3.86 | 4.64 | 6.79 | 3.65 | 1.50 | 101 | 103 | 113 | 80 | 46 | |
| Mar. | 3.83 | 4.63 | 6.50 | 3.90 | 2.25 | 100 | 103 | 109 | 85 | 68 | |
| Apr. | 3.84 | 4.58 | 6.25 | 3.06 | 2.25 | 100 | 102 | 104 | 86 | 68 | |
| May. | 3.84 | 4.49 | 4.85 | 2.75 | 1.32 | 100 | 99 | 81 | 60 | 40 | |
| June. | 3.82 | 4.41 | 4.31 | 2.63 | 1.16 | 100 | 98 | 72 | 57 | 35 | |
| July. | 3.81 | 4.39 | 4.55 | 2.95 | 1.40 | 100 | 98 | 76 | 64 | 43 | |
| Aug. | 3.78 | 4.36 | 5.50 | 3.53 | 1.03 | 99 | 97 | 92 | 77 | 31 | |
| Sept. | 3.77 | 4.35 | 6.25 | 4.04 | 1.56 | 99 | 96 | 104 | 88 | 47 | |
| Oct. | 3.80 | 4.38 | 6.44 | 4.81 | 2.17 | 99 | 97 | 108 | 105 | 66 | |
| Nov. | 3.79 | 4.42 | 5.50 | 4.07 | 1.97 | 99 | 98 | 92 | 89 | 60 | |
| Dec. | 3.84 | 4.49 | 6.80 | 4.58 | 4.56 | 100 | 100 | 114 | 100 | 138 | |
| 1896—Jan. | 3.83 | 4.53 | 8.90 | 6.00 | 4.90 | 100 | 100 | 149 | 131 | 149 | |
| Feb. | 3.80 | 4.46 | 7.31 | 5.70 | 3.94 | 99 | 99 | 122 | 124 | 120 | |
| Mar. | 3.81 | 4.46 | 6.56 | 5.18 | 3.50 | 100 | 99 | 110 | 113 | 106 | |
| Apr. | 3.81 | 4.46 | 6.31 | 5.31 | 3.02 | 100 | 99 | 105 | 116 | 92 | |
| May. | 3.83 | 4.44 | 5.75 | 4.53 | 2.53 | 100 | 98 | 90 | 99 | 77 | |
| June. | 3.82 | 4.45 | 5.75 | 4.25 | 1.94 | 100 | 99 | 96 | 93 | 59 | |
| July. | 3.89 | 4.59 | 6.40 | 5.13 | 2.07 | 102 | 102 | 107 | 112 | 63 | |
| Aug. | 3.97 | 4.75 | 8.33 | 7.75 | 4.69 | 104 | 105 | 139 | 169 | 142 | |
| Sept. | 3.91 | 4.67 | 9.10 | 8.44 | 5.45 | 102 | 104 | 152 | 184 | 166 | |
| Oct. | 3.90 | 4.65 | 8.56 | 8.56 | 11.13 | 102 | 103 | 143 | 187 | 338 | |
| Nov. | 3.86 | 4.50 | 6.19 | 5.25 | 6.25 | 101 | 100 | 103 | 115 | 190 | |
| Dec. | 3.80 | 4.46 | 5.10 | 3.75 | 1.95 | 99 | 99 | 85 | 82 | 59 | |
| 1897—Jan. | 3.78 | 4.44 | 4.69 | 3.36 | 1.78 | 99 | 98 | 78 | 73 | 54 | |
| Feb. | 3.75 | 4.42 | 4.50 | 3.00 | 1.63 | 98 | 98 | 75 | 65 | 50 | |
| Mar. | 3.78 | 4.43 | 4.50 | 3.33 | 1.62 | 99 | 98 | 75 | 73 | 49 | |
| Apr. | 3.73 | 4.45 | 4.63 | 3.55 | 1.50 | 97 | 98 | 77 | 77 | 46 | |
| May. | 3.73 | 4.44 | 4.75 | 3.54 | 1.41 | 97 | 98 | 79 | 77 | 43 | |
| June. | 3.71 | 4.39 | 4.30 | 3.16 | 1.20 | 97 | 97 | 72 | 69 | 36 | |
| July. | 3.66 | 4.34 | 4.38 | 3.43 | 1.19 | 96 | 96 | 73 | 75 | 30 | |
| Aug. | 3.71 | 4.34 | 4.81 | 3.75 | 1.25 | 97 | 96 | 80 | 82 | 38 | |
| Sept. | 3.73 | 4.34 | 5.20 | 4.11 | 2.22 | 97 | 96 | 87 | 90 | 67 | |
| Oct. | 3.73 | 4.35 | 5.25 | 4.19 | 2.50 | 97 | 96 | 88 | 91 | 76 | |
| Nov. | 3.67 | 4.31 | 4.63 | 3.45 | 1.81 | 96 | 96 | 77 | 75 | 55 | |
| Dec. | 3.65 | 4.26 | 5.00 | 3.47 | 2.92 | 95 | 95 | 84 | 76 | 89 | |
| 1898—Jan. | 3.67 | 4.20 | 4.63 | 3.35 | 2.50 | 96 | 93 | 77 | 73 | 76 | |
| Feb. | 3.66 | 4.18 | 4.56 | 3.13 | 1.78 | 96 | 93 | 76 | 68 | 54 | |
| Mar. | 3.71 | 4.30 | 6.10 | 4.69 | 2.17 | 97 | 95 | 102 | 102 | 66 | |
| Apr. | 3.84 | 4.40 | 7.58 | 5.75 | 2.97 | 100 | 98 | 127 | 125 | 90 | |
| May. | 3.78 | 4.29 | 6.10 | 4.63 | 1.95 | 99 | 95 | 102 | 101 | 59 | |
| June. | 3.72 | 4.21 | 5.00 | 3.22 | 1.25 | 97 | 93 | 84 | 70 | 38 | |
| July. | 3.69 | 4.18 | 5.00 | 3.63 | 1.25 | 96 | 93 | 84 | 79 | 38 | |
| Aug. | 3.67 | 4.16 | 5.20 | 3.64 | 1.70 | 96 | 92 | 87 | 79 | 52 | |
| Sept. | 3.68 | 4.18 | 5.50 | 4.14 | 3.78 | 96 | 93 | 92 | 90 | 115 | |
| Oct. | 3.67 | 4.17 | 4.94 | 3.39 | 2.25 | 96 | 92 | 83 | 74 | 68 | |
| Nov. | 3.64 | 4.13 | 4.75 | 3.31 | 2.10 | 95 | 92 | 79 | 72 | 64 | |
| Dec. | 3.61 | 4.09 | 4.69 | 3.05 | 2.41 | 94 | 91 | 78 | 67 | 73 | |
| 1899—Jan. | 3.59 | 4.02 | 4.50 | 2.88 | 2.72 | 94 | 89 | 75 | 63 | 83 | |
| Feb. | 3.58 | 3.99 | 4.50 | 2.95 | 2.47 | 94 | 89 | 75 | 64 | 75 | |

TABLE V—Continued

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 =100 | | | | | |
|-----------|--------------------------|----------------------|------------------|------------|-------------------------------|--|----------------------|------------------|------------|-------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1899—Mar. | 3.56 | 3.99 | 5.20 | 3.79 | 4.10 | 93 | 89 | 87 | 83 | 125 | |
| Apr. | 3.54 | 3.95 | 5.25 | 3.71 | 5.13 | 92 | 88 | 88 | 81 | 156 | |
| May. | 3.54 | 3.92 | 4.80 | 3.59 | 3.52 | 92 | 87 | 80 | 78 | 107 | |
| June. | 3.50 | 3.89 | 4.50 | 3.31 | 2.63 | 91 | 86 | 75 | 72 | 80 | |
| July. | 3.49 | 3.90 | 5.06 | 3.66 | 4.47 | 91 | 87 | 85 | 80 | 136 | |
| Aug. | 3.51 | 3.90 | 5.70 | 4.35 | 3.27 | 92 | 87 | 95 | 95 | 99 | |
| Sept. | 3.58 | 3.94 | 6.29 | 4.83 | 6.38 | 94 | 88 | 105 | 105 | 194 | |
| Oct. | 3.58 | 3.98 | 6.00 | 5.10 | 7.50 | 94 | 88 | 100 | 111 | 228 | |
| Nov. | 3.57 | 3.98 | 6.80 | 5.36 | 7.60 | 93 | 88 | 114 | 117 | 231 | |
| Dec. | 3.63 | 4.03 | 7.38 | 5.88 | 11.13 | 95 | 90 | 123 | 128 | 338 | |
| 1900—Jan. | 3.58 | 4.01 | 6.60 | 4.81 | 4.15 | 94 | 89 | 110 | 105 | 126 | |
| Feb. | 3.53 | 3.95 | 6.00 | 4.43 | 2.25 | 92 | 88 | 100 | 97 | 68 | |
| Mar. | 3.56 | 3.94 | 6.13 | 4.86 | 3.94 | 93 | 88 | 102 | 106 | 120 | |
| Apr. | 3.54 | 3.91 | 5.69 | 4.30 | 3.06 | 93 | 87 | 95 | 94 | 93 | |
| May. | 3.59 | 3.94 | 5.25 | 3.69 | 2.00 | 94 | 88 | 88 | 81 | 61 | |
| June. | 3.56 | 3.97 | 5.00 | 3.69 | 1.69 | 93 | 88 | 84 | 81 | 51 | |
| July. | 3.58 | 3.97 | 5.25 | 4.00 | 1.53 | 94 | 88 | 88 | 87 | 46 | |
| Aug. | 3.60 | 3.97 | 5.60 | 4.22 | 1.30 | 94 | 88 | 94 | 92 | 39 | |
| Sept. | 3.58 | 3.96 | 5.56 | 4.45 | 1.61 | 94 | 88 | 93 | 97 | 49 | |
| Oct. | 3.58 | 3.96 | 6.08 | 5.06 | 3.57 | 94 | 88 | 102 | 110 | 108 | |
| Nov. | 3.57 | 3.91 | 5.50 | 4.39 | 5.06 | 93 | 87 | 92 | 96 | 154 | |
| Dec. | 3.53 | 3.86 | 5.81 | 4.75 | 5.13 | 92 | 86 | 97 | 104 | 156 | |
| 1901—Jan. | 3.51 | 3.83 | 5.44 | 4.08 | 3.07 | 92 | 85 | 91 | 89 | 93 | |
| Feb. | 3.49 | 3.79 | 5.00 | 3.70 | 2.00 | 91 | 84 | 84 | 81 | 61 | |
| Mar. | 3.48 | 3.75 | 4.83 | 3.75 | 2.34 | 91 | 83 | 81 | 82 | 71 | |
| Apr. | 3.51 | 3.77 | 5.44 | 3.97 | 4.30 | 92 | 84 | 91 | 87 | 131 | |
| May. | 3.55 | 3.79 | 5.50 | 3.95 | 6.88 | 93 | 84 | 92 | 86 | 209 | |
| June. | 3.55 | 3.78 | 5.25 | 3.94 | 4.31 | 93 | 84 | 88 | 86 | 131 | |
| July. | 3.57 | 3.80 | 5.40 | 4.25 | 4.30 | 93 | 85 | 90 | 93 | 131 | |
| Aug. | 3.55 | 3.81 | 5.75 | 4.50 | 2.44 | 93 | 85 | 96 | 98 | 74 | |
| Sept. | 3.56 | 3.82 | 5.79 | 4.94 | 4.34 | 93 | 85 | 97 | 108 | 132 | |
| Oct. | 3.58 | 3.81 | 5.35 | 4.64 | 3.55 | 94 | 85 | 89 | 101 | 108 | |
| Nov. | 3.58 | 3.79 | 5.38 | 4.72 | 4.19 | 94 | 84 | 90 | 103 | 127 | |
| Dec. | 3.56 | 3.78 | 5.63 | 4.90 | 6.25 | 93 | 84 | 94 | 107 | 190 | |
| 1902—Jan. | 3.56 | 3.76 | 5.55 | 4.56 | 4.57 | 93 | 84 | 93 | 99 | 139 | |
| Feb. | 3.57 | 3.75 | 5.25 | 4.00 | 2.38 | 93 | 84 | 88 | 87 | 72 | |
| Mar. | 3.56 | 3.74 | 5.50 | 4.37 | 3.94 | 93 | 83 | 92 | 95 | 120 | |
| Apr. | 3.56 | 3.72 | 5.28 | 4.53 | 5.10 | 93 | 83 | 88 | 99 | 155 | |
| May. | 3.54 | 3.72 | 5.50 | 4.54 | 5.56 | 93 | 83 | 92 | 99 | 169 | |
| June. | 3.53 | 3.74 | 5.33 | 4.42 | 2.84 | 92 | 83 | 89 | 96 | 86 | |
| July. | 3.51 | 3.75 | 5.65 | 4.64 | 3.52 | 92 | 83 | 94 | 101 | 107 | |
| Aug. | 3.52 | 3.78 | 5.75 | 4.82 | 3.78 | 92 | 84 | 96 | 105 | 115 | |
| Sept. | 3.53 | 3.80 | 6.17* | 5.58* | 10.80 | 92 | 85 | 103* | 122* | 328 | |
| Oct. | 3.56 | 3.82 | 6.93* | 5.90* | 7.63 | 93 | 85 | 116* | 129* | 232 | |
| Nov. | 3.58 | 3.82 | 6.29 | 5.71 | 4.88 | 94 | 85 | 105 | 125 | 148 | |
| Dec. | 3.61 | 3.85 | 6.50* | 6.00* | 6.81 | 94 | 86 | 109* | 131* | 207 | |
| 1903—Jan. | 3.63 | 3.84 | 5.71 | 5.22 | 5.75 | 95 | 86 | 95 | 114 | 175 | |
| Feb. | 3.62 | 3.85 | 5.60 | 4.90 | 2.88 | 95 | 86 | 94 | 107 | 87 | |
| Mar. | 3.64 | 3.91 | 6.08* | 5.54* | 6.00 | 95 | 87 | 102* | 121* | 184 | |
| Apr. | 3.69 | 3.95 | 5.91 | 5.19 | 4.19 | 96 | 88 | 99 | 113 | 127 | |
| May. | 3.69 | 3.93 | 5.66 | 4.75 | 2.44 | 96 | 87 | 95 | 104 | 74 | |
| June. | 3.69 | 3.98 | 5.81 | 5.16 | 3.05 | 96 | 89 | 97 | 113 | 93 | |
| July. | 3.72 | 4.01 | 6.00 | 5.43 | 2.50 | 97 | 89 | 100 | 118 | 76 | |
| Aug. | 3.72 | 4.07 | 6.75 | 5.94 | 2.03 | 97 | 90 | 113 | 130 | 62 | |
| Sept. | 3.72 | 4.06 | 6.75 | 6.00 | 2.32 | 97 | 90 | 113 | 131 | 70 | |
| Oct. | 3.77 | 4.00 | 6.50 | 5.79 | 2.69 | 99 | 89 | 109 | 126 | 82 | |
| Nov. | 3.77 | 3.98 | 6.57 | 5.95 | 5.19 | 99 | 89 | 110 | 130 | 158 | |
| Dec. | 3.74 | 3.98 | 6.55 | 5.79 | 5.50 | 98 | 89 | 109 | 126 | 167 | |

* Nominal part of the month.

TABLE V—Continued

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 =100 | | | | | |
|---------------|--------------------------|----------------------|------------------|------------|-------------------------------|--|----------------------|------------------|------------|-------------------------------|--|
| | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | Bonds | | Commercial Paper | | Call Loans at Stock Ex-change | |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | |
| 1904-Jan..... | 3.72 | 3.96 | 5.53 | 4.89 | 2.34 | 97 | 88 | 92 | 107 | 71 | |
| Feb..... | 3.70 | 3.97 | 5.75 | 4.79 | 1.81 | 97 | 88 | 96 | 105 | 55 | |
| Mar..... | 3.73 | 3.99 | 5.55 | 4.68 | 1.75 | 97 | 89 | 93 | 102 | 53 | |
| Apr..... | 3.75 | 3.96 | 4.75 | 4.13 | 1.38 | 98 | 88 | 79 | 90 | 42 | |
| May..... | 3.74 | 3.95 | 4.75 | 3.93 | 1.55 | 98 | 88 | 79 | 86 | 47 | |
| June..... | 3.74 | 3.95 | 4.63 | 3.60 | 1.13 | 98 | 88 | 77 | 79 | 34 | |
| July..... | 3.72 | 3.90 | 4.63 | 3.55 | 1.03 | 97 | 87 | 77 | 77 | 31 | |
| Aug..... | 3.72 | 3.89 | 4.75 | 3.84 | .90 | 97 | 87 | 79 | 84 | 27 | |
| Sept..... | 3.72 | 3.89 | 5.38 | 4.29 | 1.53 | 97 | 87 | 90 | 94 | 46 | |
| Oct..... | 3.71 | 3.87 | 5.75 | 4.41 | 2.03 | 97 | 86 | 96 | 96 | 62 | |
| Nov..... | 3.71 | 3.85 | 5.15 | 4.14 | 2.80 | 97 | 86 | 86 | 90 | 85 | |
| Dec..... | 3.70 | 3.85 | 5.06 | 4.28 | 3.13 | 97 | 86 | 85 | 93 | 95 | |
| 1905-Jan..... | 3.69 | 3.83 | 4.71 | 4.00 | 2.25 | 96 | 85 | 79 | 87 | 68 | |
| Feb..... | 3.68 | 3.81 | 4.71 | 3.81 | 2.19 | 96 | 85 | 79 | 83 | 67 | |
| Mar..... | 3.70 | 3.82 | 4.75 | 3.93 | 3.20 | 97 | 85 | 79 | 86 | 97 | |
| Apr..... | 3.70 | 3.82 | 4.75 | 4.00 | 3.25 | 97 | 85 | 79 | 87 | 99 | |
| May..... | 3.72 | 3.82 | 4.75 | 3.98 | 2.42 | 97 | 85 | 79 | 87 | 73 | |
| June..... | 3.71 | 3.82 | 4.75 | 3.75 | 2.50 | 97 | 85 | 79 | 82 | 70 | |
| July..... | 3.69 | 3.81 | 4.75 | 4.13 | 2.31 | 96 | 85 | 79 | 90 | 70 | |
| Aug..... | 3.68 | 3.80 | 4.85 | 4.19 | 2.05 | 96 | 85 | 81 | 91 | 62 | |
| Sept..... | 3.69 | 3.82 | 5.63 | 4.72 | 3.56 | 96 | 85 | 94 | 103 | 108 | |
| Oct..... | 3.69 | 3.83 | 5.75 | 4.92 | 5.31 | 96 | 85 | 96 | 107 | 161 | |
| Nov..... | 3.72 | 3.83 | 6.00 | 5.53 | 7.70 | 97 | 85 | 100 | 121 | 234 | |
| Dec..... | 3.74 | 3.86 | 6.75 | 5.79 | 16.50 | 98 | 86 | 113 | 126 | 501 | |
| 1906-Jan..... | 3.71 | 3.85 | 5.75 | 5.06 | 8.65 | 97 | 86 | 96 | 110 | 263 | |
| Feb..... | 3.74 | 3.86 | 5.79 | 5.04 | 4.63 | 98 | 86 | 97 | 110 | 141 | |
| Mar..... | 3.76 | 3.90 | 6.00 | 5.28 | 4.88 | 98 | 87 | 100 | 115 | 148 | |
| Apr..... | 3.78 | 3.92 | 5.92 | 5.44 | 9.50 | 99 | 87 | 99 | 119 | 289 | |
| May..... | 3.80 | 3.93 | 5.81 | 5.33 | 4.15 | 99 | 88 | 97 | 116 | 126 | |
| June..... | 3.79 | 3.94 | 5.75 | 5.25 | 3.25 | 99 | 88 | 96 | 115 | 99 | |
| July..... | 3.80 | 3.95 | 5.93 | 5.48 | 2.97 | 99 | 88 | 99 | 120 | 90 | |
| Aug..... | 3.83 | 3.98 | 6.50 | 6.00 | 4.44 | 100 | 88 | 109 | 131 | 135 | |
| Sept..... | 3.84 | 3.99 | 7.21 | 6.56 | 9.38 | 100 | 89 | 120 | 143 | 285 | |
| Oct..... | 3.83 | 3.98 | 6.85 | 6.30 | 5.15 | 100 | 89 | 114 | 137 | 156 | |
| Nov..... | 3.84 | 3.98 | 6.69 | 6.25 | 7.50 | 100 | 89 | 112 | 136 | 228 | |
| Dec..... | 3.84 | 4.00 | 6.75 | 6.25 | 14.00 | 100 | 89 | 113 | 136 | 425 | |
| 1907-Jan..... | 3.85 | 4.01 | 6.69 | 6.15 | 6.15 | 101 | 90 | 112 | 134 | 187 | |
| Feb..... | 3.85 | 4.03 | 6.50 | 5.94 | 4.38 | 101 | 90 | 109 | 130 | 133 | |
| Mar..... | 3.98 | 4.12 | 6.81 | 6.19 | 6.38 | 103 | 92 | 114 | 135 | 194 | |
| Apr..... | 3.91 | 4.13 | 6.47 | 5.92 | 2.35 | 102 | 91 | 108 | 129 | 71 | |
| May..... | 3.91 | 4.13 | 5.71 | 5.40 | 2.31 | 102 | 92 | 95 | 118 | 70 | |
| June..... | 3.90 | 4.18 | 6.25 | 5.50 | 3.13 | 102 | 93 | 104 | 120 | 95 | |
| July..... | 3.94 | 4.18 | 6.36 | 5.75 | 4.55 | 103 | 93 | 106 | 125 | 138 | |
| Aug..... | 3.99 | 4.23 | 6.60 | 6.25 | 3.06 | 104 | 94 | 110 | 136 | 93 | |
| Sept..... | 4.01 | 4.27 | 7.17 | 6.79 | 4.00 | 105 | 95 | 120 | 148 | 121 | |
| Oct..... | 4.05 | 4.37 | 7.33* | 7.10* | 21.00 | 106 | 97 | 122* | 155* | 638 | |
| Nov..... | 4.21 | 4.53 |† | 7.40* | 12.25 | 110 | 101 |† | 161* | 372 | |
| Dec..... | 4.12 | 4.44 |† | 8.00* | 14.60 | 108 | 99 |† | 175* | 443 | |
| 1908-Jan..... | 3.99 | 4.26 | 6.70 | 6.59 | 4.75 | 104 | 95 | 112 | 144 | 144 | |
| Feb..... | 3.97 | 4.24 | 5.80 | 5.06 | 1.81 | 104 | 94 | 97 | 110 | 55 | |
| Mar..... | 4.01 | 4.27 |† | 5.63 | 1.85 | 105 | 95 |† | 123 | 56 | |
| Apr..... | 4.01 | 4.22 | 5.25 | 4.38 | 1.72 | 105 | 94 | 88 | 96 | 52 | |
| May..... | 4.00 | 4.18 | 4.25 | 3.94 | 1.66 | 105 | 93 | 71 | 86 | 50 | |
| June..... | 3.93 | 4.19 | 4.64 | 3.69 | 1.52 | 103 | 93 | 78 | 81 | 46 | |
| July..... | 3.92 | 4.19 | 4.58 | 3.75 | 1.22 | 102 | 93 | 77 | 82 | 37 | |

* Nominal.

† No business.

TABLE V—*Concluded*

| | ACTUAL RATES OF INTEREST | | | | | RELATIVE RATES OF INTEREST AVERAGE ACTUAL RATES 1890-99 =100 | | | | |
|-----------|--------------------------|----------------------|------------------|------------|------------------------------|--|----------------------|------------------|------------|------------------------------|
| | Bonds | | Commercial Paper | | Call Loans at Stock Exchange | Bonds | | Commercial Paper | | Call Loans at Stock Exchange |
| | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | | West Shore R.R. | Av. of 10 R.R. Bonds | 4-6 Mos. | 60-90 Days | |
| 1908—Aug. | 3.92 | 4.13 | 4.43 | 3.61 | 1.06 | 102 | 92 | 74 | 79 | 32 |
| Sept. | 3.92 | 4.11 | 4.75 | 3.89 | 1.35 | 102 | 92 | 79 | 85 | 41 |
| Oct. | 3.93 | 4.09 |† | 4.10 | 1.44 | 103 | 91 |† | 89 | 44 |
| Nov. | 3.93 | 4.05 |† | 4.04 | 1.75 | 103 | 90 |† | 88 | 53 |
| Dec. | 3.91 | 4.02 | 4.69 | 3.85 | 2.90 | 102 | 90 | 78 | 84 | 88 |
| 1909—Jan. | 3.87 | 3.99 | 4.40 | 3.68 | 1.81 | 101 | 89 | 74 | 80 | 55 |
| Feb. | 3.85 | 3.97 | 4.22 | 3.54 | 2.25 | 101 | 88 | 70 | 77 | 68 |
| Mar. | 3.87 | 3.97 | 4.28 | 3.50 | 1.85 | 101 | 89 | 71 | 76 | 56 |
| Apr. | 3.87 | 3.97 | 4.25 | 3.50 | 1.94 | 101 | 88 | 71 | 76 | 59 |
| May. | 3.88 | 3.97 | 4.29 | 3.44 | 1.84 | 101 | 88 | 72 | 75 | 56 |
| June. | 3.91 | 4.00 | 4.21 | 3.25 | 1.87 | 102 | 89 | 70 | 71 | 57 |
| July. | 3.90 | 3.99 | 4.15 | 3.38 | 2.06 | 102 | 89 | 69 | 74 | 63 |
| Aug. | 3.90 | 4.00 | 4.56 | 4.04 | 2.17 | 102 | 89 | 76 | 88 | 66 |
| Sept. | 3.93 | 4.02 | 4.75 | 4.25 | 2.69 | 103 | 90 | 79 | 93 | 82 |
| Oct. | 3.90 | 4.03 |† | 5.03 | 4.31 | 102 | 90 |† | 110 | 131 |
| Nov. | 3.88 | 4.06 | 5.98 | 5.09 | 4.65 | 101 | 90 | 100 | 111 | 141 |
| Dec. | 3.92 | 4.05 | 5.59 | 5.09 | 5.03 | 102 | 90 | 93 | 111 | 153 |

† No business.

II. RATES OF INTEREST YIELDED BY INVESTMENTS IN BONDS

The differences shown by Table II among the net yields of the ten bonds may readily be accounted for by differences in the proportionate value of the underlying properties, by the existence or non-existence of prior liens, by the relative financial strength of the issuing or guaranteeing corporations, etc. Similarly, the frequent changes in rank among the bonds may be ascribed to alterations in these particular conditions, which a well-advised investor considers in estimating the risks he runs in buying securities.

But there is one fact of more general interest about these differences in yield. The margins between the higher and lower yields have grown narrower in the course of twenty years. In 1890 the maximum difference was $5.24 - 3.88$ per cent = 1.36; in 1900 it was $4.40 - 3.42$ per cent = 0.98; in 1909, $4.24 - 3.87$ per cent = 0.37. The chief cause of this narrowing of the margins has been an improvement since the middle nineties in the credit of the lower-grade issues among investors. The risks imputed

to the holding of bonds of such railways as, for example, the Chicago & Eastern Illinois have diminished. With one exception—the bonds of the West Shore Railroad—all the bonds gave lower yields in 1909 than in 1890. The West Shore bonds, guaranteed principal and interest by the New York Central and having over 400 years to run, were rated decidedly higher by investors in 1890 than any other security in the present list. But, since then, the improvement in the financial condition and prospects of other railways has gradually brought their obligations closer to the high standard of securities guaranteed by the New York Central. Indeed in recent years, the bonds of the Burlington, the Milwaukee, and the Central of New Jersey have frequently outranked the bonds of the West Shore.

Another factor in reducing the risk and therefore the net yields upon investments in bonds was the adoption of the gold standard in 1900. But it is clear that doubts about the dollar in which interest and principal would be paid troubled the minds of investors in railway bonds less than doubts about the financial condition of the issuing companies. For the bonds in highest credit during the nineties were not expressly payable in gold, and certain of the bonds in poorest credit were—for example, the securities of the Missouri, Kansas & Texas. The danger of payment in a silver dollar had most influence during Mr. Bryan's first campaign. In 1896, the average yield of the six gold bonds rose 0.25 per cent between June and August, and declined 0.24 per cent between August and December. Meanwhile the average yield of the four currency bonds rose 0.37 and declined 0.36 per cent.

The average yield of all ten bonds is the best available gauge of the changes in the rates which large American corporations have paid for new loans on long time since 1890, and also the best gauge of the net returns which permanent investors have received upon current purchases of bonds. But it is distinctly not the best gauge of changing rates upon long loans of substantially uniform security. For the latter purpose the yield of the West Shore bonds is preferable, since the financial credit of the guarantor was so firmly established in 1890 as to be little

shaken by the years of depression and little strengthened by the years of prosperity. In other words, the yields of this issue reflect the changes in the supply of, and the demand for, loan capital for fixed investment with less distortion by the factor of risk than do the yields of the nine other bonds. None the less, the yields of the other bonds are more typical of American experience since 1890. Hence the detailed tables have been arranged to show both the net yields of the West Shore bonds, and the average net yields of all ten.

The general course of the average yields has been as follows : Starting at 4.62 per cent in January, 1890, the rate rose with the business difficulties of the summer and autumn to 4.96 per cent in December. During the reaction which followed, the figure fell to 4.81 in February, but rose again to 4.93 in July. The extraordinary shortage in the European wheat harvest of 1891 combined with the abundant American crop to change the bond market, as it did so many other features of the business situation. Yields declined with scarcely a break to 4.59 per cent in June, 1892. Then, as financial difficulties began to accumulate again, the rate went up to 4.69 per cent in December. A brief relaxation of the strain caused a decline to 4.60 per cent in February, 1893; but when the panic broke out bonds fell in price like all other securities and the average yield mounted to 5.07 per cent in August, the highest point in the twenty years.

A prompt reduction in interest rates was one of the salient features of the intense depression which followed. By April, 1894, the average yield upon bonds was 4.55 per cent—decidedly less than before the panic began. With some interruptions, the fall continued to 4.35 per cent in September, 1895. Next year the free-silver campaign caused a vigorous advance from 4.45 per cent in June to 4.75 per cent in August; but rates fell again as Mr. Bryan's prospects of victory waned and by July, 1897, the average rate was 4.34 per cent—lower than in 1895.

During the years of business revival which followed the summer of 1897 bond yields continued to decline slowly, as they had done during the years of business depression. The only

notable interruptions of this fall occurred in March and April, 1898, when the Spanish War began; in August–December, 1899, when the Boer War broke out and the “boom” in industrial stocks threatened to collapse; in May and June, 1900, when a business reaction began in Europe and seemed imminent in America; and in the months following the Northern Pacific corner of May, 1901. The lowest point was reached in April and May, 1902—3.72 per cent.

The period of “undigested securities” or the “rich man’s panic” turned the tide, and bond yields rose rapidly to a maximum of 4.07 per cent in August, 1903. The gradual return of financial ease brought on a new decline which ran through 1904 to its culmination in August, 1905. But the record of this month—3.80 per cent—did not equal the low record of 1902.

A new phase of development began in September, 1905—business prosperity accompanied by steadily rising rates of interest on bonds, whereas the prosperous years 1898–1902 had been accompanied by falling rates. With scarcely a break, bond yields mounted month by month to a climax in November, 1907. As early as March, 1907, the highest record of the “rich man’s panic” had been surpassed, and to find an equal to the record of the panic of November—4.53 per cent—it is necessary to go back eleven years to the excited summer of 1896. But not all the ground gained in 1894–1902 was lost; for the panic of 1907 did not drive bond yields very close to the 5.07 per cent attained in 1893.

In this respect the yield upon the West Shore bonds presents a marked contrast to the average yield. This most stable of our securities had shared in most of the short-period oscillations of the average; but its long-period oscillations were different, because, as has been said, its credit was less improved by the good times after 1897 than that of the other bonds. A year before the breaking out of the crisis of 1893 the yield of the West Shore stood at 3.86 per cent; a year before the breaking out of the crisis of 1907 it stood at 3.83. The corresponding figures for the average yields were 4.59 and 3.98 per cent. The West Shore’s maximum during the two crises

was the same—4.21 per cent; the maxima of the average were 5.07 per cent and 4.53 per cent. In both cases, however, the increase in yields within the twelvemonth preceding the climax of the crisis was greater in 1907 than in 1893.

The conclusion suggested by these facts—that the demand for loan capital for fixed investment was greater in proportion to the supply in the later than in the earlier crisis—is supported by the contrast between the yields during the dull years which followed the two crises. In both cases yields declined after the panic, but the decline was notably less in the later case. On the basis of yields for the whole year, the ten bonds fell 0.16 per cent in 1893–94, and 0.06 per cent in 1907–8, while the West Shore bonds fell 0.15 per cent in the first case and 0.02 per cent in the second. In 1909, however, bond yields declined more in comparison with 1908 than they did in 1895 in comparison with 1894.

The rather unsatisfactory series for United States bonds (Table III) pursues a course somewhat different from that of the railway issues. The 4 per cents both of 1907 and of 1925 are “currency” bonds, like the bonds of the West Shore; but they appear to have been influenced much more by the difficulties of the Treasury in 1893–95 and by the free-silver campaign of 1896 than were any of the railway securities. The chief anomaly which they present is in giving higher yields in 1896 than in 1893. Thereafter for a time their course paralleled that of the West Shore bonds. That is, their yields declined from 1896 to 1901, advanced until 1904, declined in 1905, and then rose until 1907. But, instead of declining like the yields of railway bonds in 1908–9, they rose in both years, and stood at the close of the period well above their level of twenty years before. These peculiar movements of 1908–9 were influenced by the act of March 4, 1907, which legalized the practice begun by Secretary Shaw of accepting other than United States bonds as security for government deposits with the national banks, and also by the sale of Panama Canal bonds.

During all this time, of course, the actual yield upon “gov-

ernments" remained much smaller than the yield upon any of the railway issues; but the columns for relative rates show that the yield of no railway bond in the list has undergone such violent changes. Instead of proving the stablest of American securities from the investor's point of view, government bonds have proved the least stable among the bonds for which yields have been computed.

III. RATES OF INTEREST UPON SHORT-TIME LOANS

How average short-time rates of interest compare with average yields of bonds is summarily shown by the little table which follows.⁷

TABLE VI

AVERAGE RATES OF INTEREST YIELDED BY INVESTMENTS IN BONDS AND BY SHORT-TIME LOANS

| | Actual Rates | | |
|-----------------------------------|--------------|---------|-----------|
| | 1890-1909 | 1890-99 | 1900-1909 |
| United States 4's..... | 2.45 | 2.76 | 2.14 |
| West Shore bonds..... | 3.78 | 3.83 | 3.74 |
| Average of 10 railway bonds..... | 4.23 | 4.51 | 3.95 |
| Commercial paper, 4-6 months..... | 5.78 | 5.99 | 5.58 |
| Commercial paper, 60-90 days..... | 4.68 | 4.58 | 4.78 |
| Call loans..... | 3.67 | 3.29 | 4.05 |

| | Relative Rates | |
|-----------------------------------|----------------|-----------|
| | 1890-99 | 1900-1909 |
| United States 4's..... | 100 | 78 |
| West Shore bonds..... | 100 | 98 |
| Average of 10 railway bonds..... | 100 | 88 |
| Commercial paper, 4-6 months..... | 100 | 93 |
| Commercial paper, 60-90 days..... | 100 | 104 |
| Call loans..... | 100 | 123 |

The twenty-year averages of the investment rates are all lower than the like averages for commercial paper. But the call-loan rate averages less than the yields of any investments except those in government bonds.

On comparing the two decades, it appears that the short-time rates have either advanced to higher levels in 1900-1909, or re-

⁷ The comparisons in this section are slightly inaccurate, because it is necessary to set *discount* rates on commercial paper against *interest* rates on investments in bonds and on call loans.

ceded but little;⁸ while all the investment rates, except that on West Shore bonds, declined considerably. The diminution of risks seems to have been a less important factor in the market for short-time loans than in the market for investment securities.

Not less important than these differences in the long-period averages of investment and short-time rates are the differences in stability. How much wider is the range through which the short-time rates fluctuate appears from a glance at the extreme variations.

TABLE VII

EXTREME VARIATIONS IN THE MONTHLY RATES OF INTEREST YIELDED BY INVESTMENTS IN BONDS AND BY SHORT-TIME LOANS, 1890-1909

| | ACTUAL RATES | | | | | RELATIVE RATES | | |
|---------------------------------------|--------------|-------|--------------|------|------------|----------------|--------|------------|
| | Highest | | Lowest | | Difference | Highest | Lowest | Difference |
| | Date | Rate | Date | Rate | | | | |
| West Shore bonds.. | { Aug. '93 } | 4.21 | Mar. '01 | 3.48 | .73 | 110 | 91 | 19 |
| Average of 10 rail- way bonds..... | { Nov. '07 } | 5.07 | { Apr. '02 } | 3.72 | 1.35 | 112 | 83 | 29 |
| Commercial paper 4-6 months..... | Aug. '93 | 10.14 | { May '02 } | | | | | |
| Commercial paper 60-90 days..... | Sept. '93 | 9.75 | July '09 | 4.15 | 5.99 | 169 | 69 | 100 |
| Call loans..... | July '93 | 21.00 | June '05 | 2.63 | 7.12 | 213 | 57 | 156 |
| | Oct. '07 | | Aug. '04 | .90 | 20.10 | 638 | 27 | 611 |

What holds of these extreme variations holds also of the variations from one season of the year to the next. There is but a slight difference between the summer and autumn yields of bonds, while the rates for commercial paper and call loans undergo marked changes. Twenty-year averages for each month show the general trend of the market. Starting from the lowest point of the year in June, rates for commercial paper rise to their highest point in September or October, and then decline until February, when they stand little above the lowest level of the summer. The opening of spring business causes a temporary advance in March; but the tide quickly turns and rates decline through April and May to the low starting-point of June. Call-

⁸ If the quotations for commercial paper, 4-5 months, during the crisis of 1907 were more complete, that class of short-time loans would probably show scarcely any decline in the second decade.

loan rates pursue a somewhat similar but more erratic course; for their monthly averages, even over a period of twenty years, are disturbed by the extremely high rates which occur during panics and periods of feverish speculation in stocks.⁹

TABLE VIII
AVERAGE SEASONAL VARIATIONS IN THE RATES OF INTEREST YIELDED BY INVESTMENTS
IN BONDS AND BY SHORT-TIME LOANS DURING TWENTY YEARS

| | WEST SHORE RAILROAD BONDS | AVERAGE OF 10 RAILWAY BONDS | COMMERCIAL PAPER | | CALL LOANS |
|---------------|---------------------------------|-----------------------------------|------------------|------------|------------|
| | | | 4-6 Months | 60-90 Days | |
| January..... | 3.77 | 4.23 | 5.81 | 4.59 | 3.79 |
| February..... | 3.76 | 4.21 | 5.55 | 4.27 | 2.55 |
| March..... | 3.77 | 4.23 | 5.74 | 4.66 | 3.41 |
| April..... | 3.78 | 4.23 | 5.62 | 4.51 | 3.36 |
| May..... | 3.79 | 4.21 | 5.41 | 4.26 | 2.85 |
| June..... | 3.77 | 4.22 | 5.37 | 4.20 | 2.64 |
| July..... | 3.78 | 4.24 | 5.54 | 4.50 | 2.69 |
| August..... | 3.80 | 4.25 | 5.91 | 4.93 | 2.87 |
| September... | 3.79 | 4.25 | 6.33 | 5.24 | 4.06 |
| October..... | 3.80 | 4.24 | 6.40 | 5.23 | 5.02 |
| November... | 3.80 | 4.23 | 6.01 | 5.02 | 4.75 |
| December.... | 3.79 | 4.23 | 6.02 | 4.99 | 6.01 |

Table IX shows the average rates of interest yielded by investments in bonds and by short-time loans for the successive phases of each business cycle since 1890. Here the differences which have been commented upon reappear in another form. The lower range of average bond yields in the second decade is contrasted with the relative stability of the ten-year levels for commercial paper. On the other hand, in short periods bond yields are stable and short-time loan rates are variable. But all the rates show the powerful influence of changing business conditions.

⁹ The frequent deviations from the general seasonal trend may be followed in the monthly figures of Table V.

The twenty-year averages by years which may be computed from Table VIII do not agree precisely in all cases with the corresponding figures of Table VI. For an explanation, see the statement in the first section of this paper concerning the methods by which the monthly, quarterly, and yearly averages for short-time rates were made. The figures by years are more accurate than the figures by months.

Since this paper was written Professor E. W. Kemmerer's *Seasonal Variations in the Relative Demand for Money and Capital in the United States* (Senate Document, No. 588, 61st Cong., 2d sess.) has appeared. It provides detailed statistics of the changes in interest rates from one season of the year to the next. The results of the two investigations are in close agreement.

TABLE IX

RATES OF INTEREST YIELDED BY INVESTMENTS IN BONDS AND BY SHORT-TIME
LOANS IN SEASONS OF BUSINESS PROSPERITY, CRISIS, AND DEPRESSION,
1890-1909

| | ACTUAL RATES | | | | | RELATIVE RATES | | | | |
|---|---------------|--------------|-------------|---------------|---------------|----------------|--------------|-------------|---------------|---------------|
| | Bonds | | Com. Paper | | Call Loans | Bonds | | Com. Paper | | Call Loans |
| | West Shore | Av. of to | 4-6 Mos. | 60-90 Days | | West Shore | Av. of to | 4-6 Mos. | 60-90 Days | |
| | | | | | | | | | | |
| Jan., 1890-July, 1890-Prosperity.... | 3.83 | 4.65 | 6.41 | 5.17 | 4.96 | 100 | 103 | 107 | 113 | 151 |
| Aug., 1890-Dec., 1890-Minor crisis.. | 3.94 | 4.82 | 7.60 | 6.56 | 7.08 | 103 | 107 | 127 | 143 | 215 |
| Jan., 1891-July, 1891-Depression.... | 3.96 | 4.87 | 6.57 | 5.38 | 3.26 | 103 | 108 | 110 | 117 | 99 |
| Aug., 1891-Aug., 1892-Prosperity.... | 3.92 | 4.70 | 5.51 | 4.30 | 2.57 | 102 | 104 | 92 | 94 | 78 |
| Sept., 1892-Apr., 1893-Approach of crisis..... | 3.94 | 4.65 | 6.24 | 5.38 | 5.23 | 103 | 103 | 104 | 117 | 159 |
| May, 1893-Oct., 1893-Major crisis.. | 4.09 | 4.86 | 9.23 | 8.19 | 5.31 | 107 | 108 | 154 | 179 | 161 |
| Nov., 1893-Mar., 1895-Severe de- pression..... | 3.87 | 4.60 | 5.48 | 3.25 | 1.22 | 101 | 102 | 92 | 71 | 37 |
| Apr., 1895-Sept., 1895-Revival..... | 3.81 | 4.43 | 5.29 | 3.31 | 1.45 | 100 | 98 | 88 | 72 | 44 |
| Oct., 1895-June, 1896-Renewed de- pression..... | 3.81 | 4.45 | 6.59 | 4.94 | 3.17 | 100 | 99 | 110 | 108 | 96 |
| July, 1896-Oct., 1896-Free silver campaign..... | 3.92 | 4.67 | 8.10 | 7.47 | 5.84 | 102 | 104 | 135 | 163 | 177 |
| Nov., 1896-June, 1897-Depression.. | 3.77 | 4.44 | 4.83 | 3.62 | 2.17 | 99 | 98 | 81 | 79 | 66 |
| July, 1897-Feb., 1898-Revival..... | 3.69 | 4.29 | 4.81 | 3.61 | 2.02 | 96 | 95 | 80 | 79 | 61 |
| Mar., 1898-Apr., 1898-Span. war im- pending..... | 3.78 | 4.35 | 6.84 | 5.22 | 2.57 | 99 | 96 | 114 | 114 | 78 |
| May, 1898-Sept., 1899-Prosperity... | 3.61 | 4.05 | 5.12 | 3.65 | 3.02 | 94 | 90 | 86 | 80 | 92 |
| Oct., 1899-Dec., 1899-Minor crisis.. | 3.59 | 4.00 | 6.73 | 5.45 | 8.74 | 94 | 89 | 112 | 119 | 265 |
| Jan., 1900-Sept., 1900-Slight depres- sion..... | 3.57 | 3.96 | 5.68 | 4.27 | 2.39 | 93 | 88 | 95 | 93 | 73 |
| Oct., 1900-Oct., 1902-Prosperity... | 3.54 | 3.79 | 5.56 | 4.52 | 4.47 | 93 | 84 | 93 | 99 | 136 |
| Nov., 1902-July, 1904-"Rich man's panic"..... | 3.70 | 3.95 | 5.82 | 5.09 | 3.20 | 97 | 88 | 97 | 111 | 97 |
| Aug., 1904-Aug., 1905-Revival..... | 3.70 | 3.84 | 4.93 | 4.06 | 2.35 | 97 | 85 | 82 | 80 | 71 |
| Sept., 1905-Sept., 1906-Prosperity... | 3.76 | 3.90 | 6.06 | 5.42 | 6.53 | 98 | 86 | 101 | 118 | 198 |
| Oct., 1906-Sept., 1907-Approach of crisis..... | 3.90 | 4.10 | 6.57 | 6.06 | 5.25 | 102 | 91 | 110 | 132 | 159 |
| Oct., 1907-Dec., 1907-Major crisis | 4.13 | 4.45 | *7.33 | 7.50 | 15.95 | 108 | 99 | *122 | 164 | 484 |
| Jan., 1908-Sept., 1908-Severe de- pression..... | 3.96 | 4.20 | 5.95 | 4.50 | 1.88 | 103 | 93 | 84 | 98 | 57 |
| Oct., 1908-Dec., 1909-Revival..... | 3.90 | 4.01 | 4.61 | 3.99 | 2.57 | 102 | 89 | 77 | 87 | 78 |

* Nominal.

In the periods of business depression which follow on crises, rates of interest on well-secured loans of all kinds fall.¹⁰ Call rates and discounts on 60-90 day commercial paper reach their lowest points in such seasons (see Tables VII and V); but the rates on 4-6 months paper and on bonds usually continue their decline through at least the earlier stages of the succeeding revival of activity. When the tide of prosperity rises, however, all the short-time rates run up. Even the current yields upon bonds rise if the prosperity is long continued and the demand for in-

¹⁰ Borrowers in doubtful credit, whether merchants selling commercial paper or corporations selling bonds, may find it difficult to secure loans at any price in such seasons, or may be forced to pay very high rates as an offset to the risks incurred by lenders.

vestment loans grows great, as in 1905-7. On the other hand, bond yields may continue to decline throughout a prosperous season as in 1897-1902, if the dwindling of imputed risks is notable. Finally, when the crisis comes, rates on all kinds of loans reach their highest points. The available market quotations fail to show the full increase in the discount upon commercial paper during panics, because many loans of this character can scarcely be negotiated on any terms, and because the rates for such business as is done are often above the nominal quotations. But when the pressure of the panic relaxes, rates to solvent borrowers fall off rapidly to the low points characteristic of depression.

IV. THE PRICES OF BONDS AND OF STOCKS

In dealing with the interest rates yielded by bonds and by short-time loans so far, it has been tacitly assumed that the lender holds his claim until maturity and receives from the borrower the amount of the nominal principal. This assumption accords with the prevailing American practice in the case of short-time loans, but not in the case of bonds. Investors often sell such securities long before maturity. When they do so, the net yields computed from bond tables, which distribute the differences between the par value and the purchase prices of bonds over the period which they have to run, generally fail to show the true return upon the investment. For a change in the prices of bonds between the dates of purchase and sale may involve the investor in loss, or may bring a profit in addition to the interest received.

To compute the net returns realized by investors who thus shift their holdings frequently is not feasible, because of the countless possible combinations of buying and selling dates. But it is feasible to show the general run of the profits and losses arising from sales before maturity, by computing the variations in the relative prices of bonds. The results may also be used for comparing the fluctuations in the prices of bonds with the fluctuations in the prices of stocks and commodities.

The usual method of constructing index numbers by turning actual prices into percentages and averaging the latter cannot

be applied to bonds. For, unlike staple commodities and standard stocks, all bonds which terminate in a given year are constantly changing their net values through mere lapse of time. The thing valued in the bond is the expectation of a specified annual payment for a specified number of years, coupled with repayment of the principal sum at the date of maturity. As this number of years grows less with each passing season, the thing valued changes. Bond-market quotations, therefore, represent changing prices of goods which themselves are changing. Of course, the relative prices of such changing goods cannot fairly be compared with the relative prices of shares in continuous business enterprises or of substantially uniform commodities.

But an approximately accurate series of relative bond prices can be constructed by an indirect method. The preceding tables of bond yields show for each year the annual payments for which investors have been willing to lend \$100 to certain borrowers under specific agreements as to security, etc. The principal is fixed, the interest variable. But the conditions may be reversed and the principal treated as variable, the interest as fixed. That is, the problem may be stated in the form: How large a loan have investors been willing to make in each successive year in return for annual payments of some given amount, such as the average net yields for 1890-99? The problem is solved by dividing the average net yields for the decade by the average net yields for each month or year.

For example: In 1890-99, men who bought the bonds of the Chesapeake & Ohio Railway, secured by a first consolidated mortgage, required net annual interest payments averaging \$4.70 for each \$100 invested. But in 1890 they required \$5.09 per annum for each \$100 put into these bonds. Had the railway offered them interest at the rate of \$4.70 in this year, they would have lent it a principal sum represented by the equation $100 (\$4.70 \div \$5.09) = \$92.34$. In this fashion one may compute for each month and year the sums which investors showed themselves ready to lend to each of the railways in return for fixed interest payments. And these sums may be regarded as the relative prices of bonds bearing a uniform rate of interest, and

having no fixed period of termination. Further, these relative prices of bonds are fairly comparable with the relative prices of stocks and commodities computed on the basis of average actual prices in 1890-99.

Table X has been made in this manner to show the relative prices of each of the ten bonds described in Table I. While no two of the bonds have agreed perfectly in their price-fluctuations, the notable feature of the table is the narrowness of the range between the highest and lowest relative prices. It would be difficult to find ten staple commodities which have kept so close together in the last twenty years. The ten common and ten preferred stocks included in the article in this *Journal* of last July have differed far more in relative prices than have the ten bonds.

Among the latter, those which have fluctuated through the widest range are, of course, the bonds which improved most in credit between 1893 and 1902. The poorest bonds have made the best investments and the best bonds the poorest. Not only have the poorer securities yielded higher net returns on their cost prices year by year (Table II), but they have also been salable on more advantageous terms—bringing decidedly higher profits until 1902, and somewhat smaller losses since then. These higher returns, however, have been obtained by running greater risks.

A comparison between index numbers for bonds, stocks, and commodities is made in Table XI. The series for United States bonds is made in the manner described from the net yields shown in Table III. The first series for stocks shows the average relative prices of ten stocks which have paid dividends in each year since 1890.¹¹ The next three series for stocks are adapted from the tables published in May and July.¹² The ten preferred and

¹¹ The common stocks of the Central Railroad of New Jersey, Chicago & Northwestern, Delaware & Hudson, Illinois Central, New York Central, New York, New Haven & Hartford, and the American Express Company, together with the preferred stocks of the Chicago, Milwaukee & St. Paul, Chicago & Northwestern, and Cleveland, Cincinnati, Chicago & St. Louis. Unfortunately the number of stocks with clear dividend records is not large enough to permit the computation of significant averages for common and preferred stocks separately.

¹² *Journal of Political Economy*, XVIII, 349, 515.

TABLE X
RELATIVE PRICES OF TEN AMERICAN RAILWAY BONDS BY YEARS, 1890-1910

| | C.&E.I. | M.K.&T. | WA-BASH | C.O. | C.St.P.&M.O. | C.B.&Q. | C.R.R. OF N.J. | C.M. & St. P. | N.Y. C. & St. L. | W.S. R.R. | AVERAGES | | |
|-----------|---------|---------|---------|-------|--------------|---------|----------------|---------------|------------------|-----------|------------|-------------|-------|
| | | | | | | | | | | | First Five | Second Five | All |
| 1890..... | 95.6 | 94.4 | 95.6 | 92.3 | 92.8 | 100.1 | 97.0 | 97.0 | 92.2 | 98.6 | 94.1 | 97.2 | 95.7 |
| 1891..... | 94.9 | 93.5 | 94.3 | 92.0 | 91.0 | 92.1 | 96.6 | 88.9 | 91.3 | 96.6 | 93.1 | 93.1 | 93.1 |
| 1892..... | 99.6 | 97.4 | 99.2 | 96.9 | 95.1 | 95.8 | 98.3 | 94.9 | 96.6 | 98.1 | 97.6 | 96.7 | 97.2 |
| 1893..... | 97.1 | 94.9 | 96.4 | 94.0 | 92.6 | 91.8 | 96.9 | 90.4 | 93.9 | 95.2 | 95.0 | 94.8 | 94.9 |
| 1894..... | 97.4 | 97.4 | 98.8 | 98.9 | 99.4 | 96.0 | 101.3 | 95.5 | 99.9 | 98.9 | 98.4 | 98.3 | 98.4 |
| 1895..... | 98.8 | 103.1 | 101.1 | 102.4 | 101.0 | 97.7 | 102.2 | 97.2 | 104.3 | 100.2 | 101.3 | 100.3 | 100.8 |
| 1896..... | 97.8 | 99.7 | 99.4 | 99.6 | 99.0 | 94.4 | 102.6 | 99.5 | 103.8 | 99.4 | 99.1 | 99.9 | 99.5 |
| 1897..... | 99.8 | 102.6 | 100.2 | 104.0 | 107.6 | 100.5 | 99.7 | 107.5 | 106.8 | 102.9 | 103.0 | 103.5 | 103.3 |
| 1898..... | 106.3 | 107.4 | 105.1 | 109.6 | 111.8 | 111.4 | 99.9 | 111.2 | 106.2 | 103.7 | 108.0 | 106.5 | 107.3 |
| 1899..... | 115.9 | 113.0 | 112.0 | 114.1 | 115.9 | 130.6 | 105.3 | 118.6 | 108.8 | 107.5 | 114.2 | 114.2 | 114.2 |
| 1900..... | 117.3 | 111.5 | 113.6 | 114.1 | 112.6 | 132.5 | 109.5 | 118.0 | 108.8 | 107.2 | 113.8 | 115.2 | 114.5 |
| 1901..... | 128.4 | 119.4 | 117.0 | 117.5 | 120.2 | 133.3 | 116.9 | 118.6 | 110.3 | 108.1 | 120.5 | 117.4 | 119.0 |
| 1902..... | 130.4 | 121.2 | 117.2 | 117.2 | 120.8 | 129.5 | 122.7 | 121.3 | 108.2 | 107.8 | 121.3 | 117.9 | 119.6 |
| 1903..... | 120.7 | 118.8 | 112.5 | 112.2 | 112.6 | 122.8 | 116.0 | 115.1 | 103.8 | 103.4 | 115.4 | 112.2 | 113.8 |
| 1904..... | 122.2 | 120.9 | 115.0 | 114.1 | 114.2 | 121.8 | 117.9 | 115.7 | 105.4 | 102.9 | 117.3 | 112.7 | 115.0 |
| 1905..... | 126.8 | 123.6 | 117.0 | 116.3 | 121.5 | 125.6 | 120.7 | 118.6 | 106.5 | 103.4 | 121.0 | 115.0 | 118.0 |
| 1906..... | 123.4 | 121.8 | 112.5 | 114.6 | 116.0 | 119.9 | 114.5 | 114.8 | 105.7 | 100.7 | 117.6 | 111.1 | 114.4 |
| 1907..... | 112.8 | 115.7 | 103.7 | 105.6 | 107.8 | 111.1 | 108.4 | 107.8 | 99.2 | 96.4 | 109.1 | 104.6 | 106.9 |
| 1908..... | 115.7 | 118.2 | 103.1 | 108.8 | 110.1 | 112.2 | 110.3 | 108.4 | 99.9 | 96.9 | 111.2 | 105.5 | 108.4 |
| 1909..... | 121.0 | 122.4 | 112.5 | 113.8 | 116.6 | 115.1 | 114.5 | 110.0 | 102.5 | 98.4 | 117.3 | 108.1 | 112.7 |

TABLE XI
RELATIVE PRICES OF BONDS, STOCKS, AND COMMODITIES BY YEARS, 1890-1909

| | BONDS | | | STOCKS | | | | COMMODITIES |
|-----------|------------------------------------|-----------------|-----------------------------|---------------------------|---------------------------------|------------------------------|--|-------------|
| | United States 4's of 1907 and 1925 | West Shore R.R. | Average of 10 Railway Bonds | 10 Dividend Paying Stocks | Preferred Stocks in 10 Railways | Common Stocks in 10 Railways | Common Stocks in 40 Transportation Companies | 145 Staples |
| 1890..... | 114 | 99 | 96 | 104 | 108 | 113 | 121 | 114 |
| 1891..... | 104 | 97 | 93 | 100 | 104 | 113 | 113 | 113 |
| 1892..... | 99 | 98 | 97 | 105 | 115 | 124 | 123 | 106 |
| 1893..... | 91 | 95 | 95 | 96 | 87 | 89 | 93 | 105 |
| 1894..... | 99 | 99 | 98 | 94 | 82 | 82 | 82 | 96 |
| 1895..... | 96 | 100 | 101 | 95 | 87 | 87 | 85 | 93 |
| 1896..... | 88 | 99 | 100 | 92 | 85 | 81 | 77 | 89 |
| 1897..... | 101 | 103 | 103 | 94 | 94 | 90 | 84 | 89 |
| 1898..... | 103 | 104 | 107 | 102 | 107 | 97 | 94 | 93 |
| 1899..... | 112 | 107 | 114 | 118 | 130 | 126 | 128 | 103 |
| 1900..... | 127 | 107 | 115 | 121 | 133 | 144 | 134 | 111 |
| 1901..... | 140 | 108 | 119 | 142 | 178 | 262 | 211 | 110 |
| 1902..... | 140 | 108 | 120 | 157 | 191 | 305 | 250 | 114 |
| 1903..... | 139 | 103 | 114 | 136 | 163 | 238 | 201 | 114 |
| 1904..... | 132 | 103 | 115 | 136 | 156 | 215 | 192 | 114 |
| 1905..... | 138 | 103 | 118 | 158 | 181 | 278 | 250 | 116 |
| 1906..... | 135 | 101 | 114 | 159 | 180 | 201 | 267 | 122 |
| 1907..... | 127 | 96 | 107 | 129 | 138 | 206 | 204 | 130 |
| 1908..... | 113 | 97 | 108 | 126 | 130 | 195 | 201 | 121 |
| 1909..... | 110 | 98 | 113 | 150 | 169 | 280 | 277 | 124 |

TABLE XII

RELATIVE PRICES OF BONDS AND STOCKS IN SEASONS OF BUSINESS PROSPERITY, CRISIS, AND DEPRESSION, 1890-1909

| | BONDS | | STOCKS | | |
|---|--------------|-------------------------------|--|---------------------------------------|---------------------------------------|
| | W.S. R.R. | Av. of to R.R. Bonds | Av. of to Pre- ferred Stocks | Av. of to Com- mon Stocks | Av. of 40 Com- mon Stocks |
| Jan., 1890—July, 1890—Prosperity... | 100 | 97 | 113 | 123 | 131 |
| Aug., 1890—Dec., 1890—Minor crisis... | 97 | 94 | 103 | 108 | 115 |
| Jan., 1891—July, 1891—Depression... | 97 | 93 | 100 | 103 | 107 |
| Aug., 1891—Aug., 1892—Prosperity... | 98 | 96 | 115 | 127 | 123 |
| Sept., 1892—Oct., 1893—Approach of crisis..... | 97 | 97 | 106 | 112 | 116 |
| May, 1893—Oct., 1893—Major crisis... | 94 | 93 | 78 | 80 | 84 |
| Nov., 1893—Mar., 1895—Severe depres- sion..... | 99 | 98 | 81 | 82 | 81 |
| Apr., 1895—Sept., 1895—Revival..... | 100 | 102 | 93 | 94 | 91 |
| Oct., 1895—June, 1896—Renewed de- pression..... | 100 | 101 | 88 | 84 | 82 |
| July, 1896—Oct., 1896—Free silver campaign..... | 98 | 97 | 79 | 74 | 71 |
| Nov., 1896—June, 1897—Depression .. | 102 | 102 | 86 | 83 | 77 |
| July, 1897—Feb., 1898—Revival..... | 104 | 105 | 103 | 98 | 93 |
| Mar., 1898—Apr., 1898—Spanish war impending..... | 101 | 104 | 98 | 85 | 87 |
| May, 1898—Sept., 1899—Prosperity... | 106 | 111 | 121 | 113 | 113 |
| Oct., 1899—Dec., 1899—Minor crisis... | 107 | 113 | 132 | 127 | 133 |
| Jan., 1900—Sept., 1900—Slight depres- sion..... | 107 | 114 | 131 | 138 | 130 |
| Oct., 1900—Oct., 1902—Prosperity... | 108 | 119 | 180 | 269 | 219 |
| Nov., 1902—July, 1904—"Rich man's panic"..... | 103 | 114 | 162 | 228 | 195 |
| Aug., 1904—Aug., 1905—Revival..... | 103 | 118 | 177 | 263 | 232 |
| Sept., 1905—Sept., 1906—Prosperity... | 102 | 116 | 182 | 290 | 265 |
| Oct., 1906—Sept., 1907—Approach of crisis..... | 98 | 110 | 157 | 242 | 231 |
| Oct., 1907—Dec., 1907—Major crisis... | 93 | 101 | 122 | 161 | 166 |
| Jan., 1908—Sept., 1908—Severe de- pression..... | 97 | 107 | 124 | 184 | 190 |
| Oct., 1908—Dec., 1909—Revival..... | 98 | 112 | 166 | 272 | 269 |

ten common stocks belong to the same railways. The forty common stocks come from thirty-five railways, three express companies, one steamship, and one telegraph company. The series for commodities is a revised form of the index number compiled by the federal Bureau of Labor. It includes all the published material for prices at wholesale; but the bureau's method of striking the grand average has been improved upon by first averaging the series for nearly related commodities—like

TABLE XIII

RELATIVE PRICES OF BONDS AND STOCKS BY MONTHS, 1890-1909

| | BONDS | | STOCKS | | | | BONDS | | STOCKS | | |
|-------------|--------------|-------------------------------|--|---------------------------------------|---------------------------------------|-------------|--------------|-------------------------------|--|---------------------------------------|---------------------------------------|
| | W.S. R.R. | Av. of 10 R.R. Bonds | Av. of 10 Pre- ferred Stocks | Av. of 10 Com- mon Stocks | Av. of 40 Com- mon Stocks | | W.S. R.R. | Av. of 10 R.R. Bonds | Av. of 10 Pre- ferred Stocks | Av. of 10 Com- mon Stocks | Av. of 40 Com- mon Stocks |
| 1890—Jan... | 99.9 | 97.7 | 113.5 | 122.5 | 129.5 | 1895—Jan... | 99.9 | 98.5 | 76.5 | 72.5 | 74.0 |
| Feb... | 100.2 | 97.0 | 112.0 | 115.0 | 126.0 | Feb... | 99.1 | 97.2 | 74.5 | 71.5 | 73.0 |
| Mar... | 99.9 | 96.6 | 107.5 | 112.5 | 123.5 | Mar... | 99.9 | 97.4 | 75.0 | 73.0 | 73.5 |
| Apr... | 99.7 | 97.3 | 111.5 | 115.5 | 127.0 | Apr... | 99.7 | 98.4 | 83.0 | 82.0 | 80.0 |
| May... | 99.7 | 97.3 | 119.0 | 130.5 | 139.0 | May... | 99.7 | 100.5 | 90.0 | 93.0 | 87.5 |
| June... | 99.9 | 97.1 | 111.5 | 133.0 | 136.0 | June... | 100.2 | 102.2 | 93.5 | 93.5 | 91.0 |
| July... | 99.4 | 96.4 | 114.0 | 127.5 | 132.5 | July... | 100.4 | 102.7 | 95.5 | 96.0 | 93.0 |
| Aug... | 98.6 | 95.4 | 112.0 | 121.0 | 130.0 | Aug... | 101.2 | 103.4 | 97.5 | 98.5 | 95.0 |
| Sept... | 98.6 | 94.7 | 111.0 | 119.5 | 124.5 | Sept... | 101.5 | 103.7 | 98.0 | 100.0 | 96.5 |
| Oct... | 97.9 | 94.7 | 104.0 | 109.5 | 116.0 | Oct... | 100.7 | 102.9 | 96.5 | 96.0 | 93.0 |
| Nov... | 95.9 | 92.3 | 93.5 | 97.0 | 104.0 | Nov... | 101.0 | 102.1 | 90.0 | 89.0 | 86.0 |
| Dec... | 94.7 | 90.9 | 92.0 | 93.5 | 99.0 | Dec... | 99.7 | 100.4 | 82.5 | 76.5 | 77.5 |
| 1891—Jan... | 97.1 | 93.5 | 99.0 | 103.5 | 107.5 | 1896—Jan... | 99.9 | 99.6 | 81.0 | 78.5 | 77.0 |
| Feb... | 97.6 | 93.8 | 101.0 | 104.0 | 109.0 | Feb... | 100.7 | 101.1 | 89.0 | 87.0 | 83.0 |
| Mar... | 97.1 | 92.8 | 96.5 | 96.0 | 104.5 | Mar... | 100.4 | 101.1 | 90.0 | 82.0 | 80.5 |
| Apr... | 97.1 | 93.2 | 103.0 | 106.0 | 110.5 | Apr... | 100.4 | 101.0 | 91.0 | 82.5 | 84.0 |
| May... | 96.6 | 92.6 | 103.5 | 108.5 | 110.5 | May... | 99.9 | 101.6 | 88.5 | 80.0 | 79.5 |
| June... | 95.9 | 91.6 | 98.5 | 102.5 | 105.5 | June... | 100.2 | 101.3 | 87.5 | 82.5 | 79.5 |
| July... | 95.4 | 91.5 | 95.5 | 98.5 | 102.5 | July... | 100.4 | 98.3 | 79.0 | 72.5 | 71.0 |
| Aug... | 95.7 | 92.2 | 101.0 | 109.5 | 110.0 | Aug... | 96.4 | 95.0 | 73.0 | 68.0 | 65.5 |
| Sept... | 96.9 | 93.1 | 114.0 | 129.5 | 124.0 | Sept... | 97.9 | 96.5 | 80.0 | 76.5 | 72.5 |
| Oct... | 95.9 | 93.6 | 113.0 | 134.0 | 125.0 | Oct... | 98.1 | 97.1 | 82.0 | 80.5 | 75.0 |
| Nov... | 96.2 | 94.0 | 107.5 | 123.0 | 119.0 | Nov... | 99.1 | 100.1 | 91.0 | 92.0 | 84.5 |
| Dec... | 96.9 | 95.3 | 115.5 | 134.5 | 125.0 | Dec... | 100.7 | 101.1 | 86.0 | 85.5 | 79.5 |
| 1892—Jan... | 98.1 | 96.7 | 123.0 | 138.5 | 128.0 | 1897—Jan... | 101.2 | 101.5 | 87.0 | 86.0 | 79.5 |
| Feb... | 98.4 | 97.3 | 124.0 | 134.5 | 126.5 | Feb... | 102.0 | 102.1 | 87.5 | 82.0 | 76.5 |
| Mar... | 98.1 | 97.0 | 123.5 | 133.0 | 125.5 | Mar... | 101.2 | 101.9 | 86.0 | 84.0 | 76.5 |
| Apr... | 98.1 | 97.4 | 119.0 | 130.5 | 124.5 | Apr... | 102.6 | 101.3 | 80.5 | 75.5 | 72.0 |
| May... | 98.9 | 98.3 | 115.5 | 124.0 | 122.5 | May... | 102.6 | 101.6 | 84.5 | 75.5 | 72.0 |
| June... | 99.1 | 98.4 | 113.5 | 118.5 | 120.5 | June... | 103.1 | 102.6 | 88.0 | 82.0 | 77.0 |
| July... | 98.4 | 97.7 | 113.5 | 119.5 | 122.5 | July... | 104.6 | 103.8 | 92.5 | 86.5 | 83.0 |
| Aug... | 98.4 | 97.3 | 114.5 | 123.0 | 125.0 | Aug... | 103.1 | 104.0 | 103.5 | 102.0 | 93.0 |
| Sept... | 97.6 | 96.7 | 108.5 | 113.5 | 118.5 | Sept... | 102.6 | 103.8 | 111.0 | 109.0 | 99.5 |
| Oct... | 97.4 | 97.0 | 110.5 | 118.5 | 123.0 | Oct... | 102.6 | 103.7 | 104.5 | 101.0 | 95.5 |
| Nov... | 98.1 | 96.7 | 108.5 | 117.5 | 119.5 | Nov... | 104.3 | 104.6 | 98.0 | 92.5 | 90.0 |
| Dec... | 97.6 | 96.3 | 105.0 | 111.0 | 115.5 | Dec... | 104.8 | 105.8 | 103.0 | 97.5 | 93.5 |
| 1893—Jan... | 97.1 | 97.1 | 108.0 | 115.0 | 119.0 | 1898—Jan... | 104.3 | 107.3 | 106.0 | 97.5 | 96.0 |
| Feb... | 97.4 | 98.1 | 105.0 | 111.0 | 114.5 | Feb... | 104.6 | 107.9 | 107.5 | 96.5 | 94.5 |
| Mar... | 96.4 | 97.3 | 99.5 | 103.5 | 107.5 | Mar... | 103.1 | 104.9 | 99.5 | 87.0 | 87.5 |
| Apr... | 95.2 | 97.3 | 101.0 | 104.0 | 109.0 | Apr... | 99.7 | 102.5 | 96.0 | 83.0 | 86.0 |
| May... | 95.0 | 95.7 | 89.0 | 92.0 | 95.0 | May... | 101.2 | 105.2 | 103.0 | 92.5 | 92.0 |
| June... | 94.5 | 94.4 | 82.5 | 84.0 | 87.5 | June... | 102.9 | 107.0 | 108.0 | 97.0 | 97.5 |
| July... | 92.4 | 91.4 | 69.5 | 71.0 | 76.5 | July... | 103.7 | 107.8 | 107.5 | 95.5 | 95.0 |
| Aug... | 90.9 | 88.9 | 69.5 | 71.5 | 74.5 | Aug... | 104.3 | 108.5 | 113.0 | 104.5 | 98.5 |
| Sept... | 93.1 | 92.3 | 77.0 | 78.0 | 82.0 | Sept... | 104.0 | 107.8 | 113.5 | 102.0 | 97.5 |
| Oct... | 95.2 | 93.9 | 78.0 | 83.5 | 85.5 | Oct... | 104.3 | 108.1 | 106.5 | 94.0 | 96.5 |
| Nov... | 97.4 | 96.5 | 81.5 | 85.5 | 87.0 | Nov... | 105.1 | 109.1 | 111.5 | 100.0 | 97.5 |
| Dec... | 97.6 | 97.0 | 81.5 | 83.0 | 83.5 | Dec... | 106.0 | 110.2 | 120.0 | 111.5 | 109.0 |
| 1894—Jan... | 97.1 | 96.3 | 79.0 | 80.5 | 82.0 | 1899—Jan... | 106.6 | 112.3 | 127.0 | 120.5 | 121.0 |
| Feb... | 98.1 | 97.2 | 80.5 | 82.5 | 83.5 | Feb... | 106.9 | 112.9 | 129.0 | 126.0 | 125.5 |
| Mar... | 98.6 | 98.2 | 85.5 | 85.5 | 87.0 | Mar... | 107.5 | 113.0 | 127.0 | 123.0 | 123.5 |
| Apr... | 99.7 | 99.1 | 89.0 | 90.5 | 89.0 | Apr... | 108.1 | 114.1 | 129.5 | 126.0 | 125.5 |
| May... | 98.6 | 98.9 | 84.0 | 84.0 | 82.0 | May... | 108.1 | 115.0 | 124.5 | 121.5 | 124.0 |
| June... | 98.6 | 98.3 | 78.5 | 79.5 | 77.5 | June... | 109.3 | 116.0 | 125.5 | 120.5 | 122.0 |
| July... | 98.6 | 97.6 | 82.0 | 76.0 | 75.0 | July... | 109.6 | 115.7 | 131.0 | 126.5 | 129.0 |
| Aug... | 98.9 | 98.1 | 83.5 | 84.5 | 81.0 | Aug... | 109.0 | 115.5 | 136.5 | 133.0 | 136.0 |
| Sept... | 99.1 | 98.8 | 86.0 | 88.5 | 84.0 | Sept... | 106.9 | 114.5 | 136.5 | 132.0 | 135.5 |
| Oct... | 99.7 | 99.1 | 79.5 | 81.0 | 80.5 | Oct... | 106.9 | 113.5 | 134.0 | 128.5 | 133.5 |
| Nov... | 100.2 | 99.5 | 81.5 | 82.0 | 80.5 | Nov... | 107.2 | 113.4 | 136.5 | 132.5 | 137.5 |
| Dec... | 99.9 | 99.0 | 78.5 | 77.0 | 78.0 | Dec... | 105.4 | 111.8 | 126.5 | 121.0 | 126.5 |

TABLE XIII—Concluded

| | BONDS | | STOCKS | | | | BONDS | | STOCKS | | |
|-------------|--------------|-------------------------------|--|---------------------------------------|---------------------------------------|-------------|--------------|-------------------------------|--|---------------------------------------|---------------------------------------|
| | W.S. R.R. | Av. of 10 R.R. Bonds | Av. of 10 Pre- ferred Stocks | Av. of 10 Com- mon Stocks | Av. of 40 Com- mon Stocks | | W.S. R.R. | Av. of 10 R.R. Bonds | Av. of 10 Pre- ferred Stocks | Av. of 10 Com- mon Stocks | Av. of 40 Com- mon Stocks |
| 1900—Jan... | 106.9 | 112.5 | 128.0 | 123.5 | 128.0 | 1905—Jan... | 103.7 | 117.8 | 181.0 | 274.5 | 236.5 |
| Feb... | 108.4 | 114.1 | 131.5 | 128.5 | 131.0 | Feb... | 104.0 | 118.3 | 185.0 | 284.0 | 247.5 |
| Mar... | 107.5 | 114.3 | 135.0 | 141.0 | 135.5 | Mar... | 103.4 | 118.2 | 186.0 | 290.0 | 253.5 |
| Apr... | 108.1 | 115.3 | 139.0 | 150.5 | 140.0 | Apr... | 103.4 | 118.2 | 181.0 | 277.0 | 245.0 |
| May... | 106.6 | 114.4 | 133.5 | 143.0 | 132.0 | May... | 102.9 | 118.0 | 174.0 | 250.5 | 230.5 |
| June... | 107.5 | 113.7 | 128.5 | 139.0 | 126.5 | June... | 103.1 | 118.0 | 177.5 | 258.0 | 232.5 |
| July... | 106.9 | 113.6 | 128.0 | 137.5 | 128.0 | July... | 103.7 | 118.3 | 182.0 | 270.0 | 243.5 |
| Aug... | 106.3 | 113.6 | 127.5 | 138.5 | 127.5 | Aug... | 104.0 | 118.6 | 188.5 | 283.5 | 256.0 |
| Sept... | 106.9 | 114.0 | 125.5 | 137.0 | 122.0 | Sept... | 103.7 | 118.1 | 184.0 | 286.5 | 259.0 |
| Oct... | 106.9 | 113.8 | 129.0 | 145.5 | 131.5 | Oct... | 103.7 | 117.9 | 187.5 | 285.5 | 261.5 |
| Nov... | 107.2 | 115.3 | 137.0 | 160.5 | 143.5 | Nov... | 102.9 | 117.8 | 180.5 | 284.0 | 261.5 |
| Dec... | 108.4 | 116.9 | 150.0 | 188.0 | 159.5 | Dec... | 102.3 | 117.0 | 188.0 | 290.5 | 266.5 |
| 1901—Jan... | 109.0 | 117.7 | 159.5 | 202.5 | 169.0 | 1906—Jan... | 103.1 | 117.2 | 187.0 | 311.5 | 279.5 |
| Feb... | 106.6 | 119.1 | 165.5 | 217.0 | 177.5 | Feb... | 102.3 | 116.7 | 186.0 | 304.5 | 271.5 |
| Mar... | 110.0 | 120.2 | 173.0 | 243.0 | 192.5 | Mar... | 101.8 | 115.7 | 185.5 | 295.0 | 264.5 |
| Apr... | 109.0 | 119.6 | 182.0 | 269.0 | 212.5 | Apr... | 101.2 | 115.1 | 180.5 | 288.0 | 261.0 |
| May... | 107.8 | 119.1 | 172.0 | 257.5 | 204.0 | May... | 100.7 | 114.7 | 176.5 | 278.0 | 254.5 |
| June... | 107.8 | 119.2 | 188.0 | 286.5 | 228.5 | June... | 101.0 | 114.3 | 184.0 | 282.0 | 259.0 |
| July... | 107.2 | 118.6 | 181.5 | 267.0 | 215.5 | July... | 100.7 | 114.1 | 179.0 | 274.0 | 253.0 |
| Aug... | 107.8 | 118.3 | 180.0 | 271.0 | 218.0 | Aug... | 99.9 | 113.5 | 173.5 | 295.0 | 272.0 |
| Sept... | 107.5 | 118.0 | 182.0 | 282.5 | 223.5 | Sept... | 99.7 | 113.1 | 177.0 | 295.5 | 278.5 |
| Oct... | 106.9 | 118.3 | 180.5 | 280.0 | 222.0 | Oct... | 99.9 | 113.4 | 184.0 | 291.0 | 274.5 |
| Nov... | 106.9 | 119.1 | 185.5 | 293.0 | 233.0 | Nov... | 99.7 | 113.3 | 184.0 | 291.5 | 270.5 |
| Dec... | 107.5 | 119.2 | 183.5 | 280.0 | 228.5 | Dec... | 99.7 | 112.6 | 173.5 | 290.5 | 270.0 |
| 1902—Jan... | 107.5 | 119.9 | 184.5 | 285.5 | 232.0 | 1907—Jan... | 99.4 | 112.5 | 171.5 | 270.0 | 256.5 |
| Feb... | 107.2 | 120.2 | 188.5 | 293.0 | 237.5 | Feb... | 99.4 | 111.9 | 164.0 | 256.5 | 243.0 |
| Mar... | 107.5 | 120.5 | 188.5 | 296.0 | 238.5 | Mar... | 97.4 | 109.5 | 147.5 | 225.5 | 218.0 |
| Apr... | 107.5 | 121.2 | 192.5 | 304.5 | 248.5 | Apr... | 97.9 | 109.1 | 144.5 | 220.5 | 216.5 |
| May... | 108.1 | 121.2 | 197.0 | 299.0 | 248.5 | May... | 97.9 | 109.2 | 142.5 | 209.5 | 206.5 |
| June... | 108.4 | 120.7 | 200.5 | 303.5 | 253.0 | June... | 98.1 | 107.9 | 153.0 | 213.5 | 205.0 |
| July... | 109.0 | 120.4 | 197.5 | 313.0 | 258.5 | July... | 97.1 | 107.9 | 149.5 | 224.5 | 215.0 |
| Aug... | 108.7 | 119.4 | 203.5 | 331.0 | 271.5 | Aug... | 95.9 | 106.7 | 147.5 | 208.0 | 197.0 |
| Sept... | 108.4 | 118.8 | 199.0 | 334.0 | 273.5 | Sept... | 95.4 | 105.6 | 123.0 | 205.0 | 197.0 |
| Oct... | 107.5 | 118.2 | 191.5 | 317.5 | 259.0 | Oct... | 94.5 | 103.3 | 126.0 | 169.5 | 171.5 |
| Nov... | 106.9 | 118.1 | 188.0 | 298.0 | 246.5 | Nov... | 99.9 | 99.5 | 117.5 | 152.5 | 159.0 |
| Dec... | 106.0 | 117.1 | 184.5 | 281.0 | 237.0 | Dec... | 92.9 | 101.6 | 123.5 | 161.5 | 167.0 |
| 1903—Jan... | 105.4 | 117.3 | 187.5 | 307.5 | 251.5 | 1908—Jan... | 95.9 | 105.8 | 124.5 | 166.5 | 174.5 |
| Feb... | 105.7 | 117.2 | 188.5 | 303.5 | 249.5 | Feb... | 96.4 | 106.4 | 102.5 | 152.0 | 159.5 |
| Mar... | 105.1 | 115.5 | 186.5 | 282.0 | 233.5 | Mar... | 95.4 | 105.6 | 120.5 | 158.0 | 170.0 |
| Apr... | 103.7 | 114.3 | 179.0 | 265.0 | 220.0 | Apr... | 95.4 | 106.8 | 119.5 | 171.0 | 181.0 |
| May... | 103.7 | 114.9 | 173.0 | 260.0 | 213.0 | May... | 95.7 | 108.0 | 119.0 | 191.5 | 198.5 |
| June... | 103.7 | 113.5 | 168.5 | 228.5 | 193.5 | June... | 97.4 | 107.6 | 125.5 | 200.5 | 199.5 |
| July... | 102.9 | 112.4 | 154.5 | 218.0 | 184.5 | July... | 97.6 | 107.7 | 133.5 | 208.0 | 206.0 |
| Aug... | 102.9 | 110.9 | 152.0 | 204.0 | 175.0 | Aug... | 97.6 | 109.2 | 135.0 | 204.5 | 211.5 |
| Sept... | 102.9 | 111.1 | 148.5 | 198.0 | 171.5 | Sept... | 97.6 | 109.7 | 134.0 | 203.0 | 212.5 |
| Oct... | 101.5 | 112.7 | 141.5 | 191.5 | 166.5 | Oct... | 97.4 | 110.3 | 138.5 | 211.5 | 217.0 |
| Nov... | 101.5 | 113.4 | 146.5 | 191.5 | 168.0 | Nov... | 97.4 | 111.3 | 149.0 | 238.0 | 238.0 |
| Dec... | 102.3 | 113.4 | 152.0 | 205.0 | 179.0 | Dec... | 97.9 | 112.1 | 160.5 | 259.5 | 252.0 |
| 1904—Jan... | 102.9 | 113.9 | 156.0 | 205.5 | 184.0 | 1909—Jan... | 98.9 | 113.2 | 164.5 | 269.0 | 259.0 |
| Feb... | 103.4 | 113.6 | 147.0 | 194.0 | 175.0 | Feb... | 99.4 | 113.7 | 156.0 | 262.5 | 253.0 |
| Mar... | 102.6 | 113.1 | 148.5 | 192.5 | 171.0 | Mar... | 98.9 | 113.6 | 161.5 | 262.0 | 257.5 |
| Apr... | 102.0 | 113.8 | 152.0 | 196.5 | 172.5 | Apr... | 98.9 | 113.5 | 172.5 | 279.0 | 272.0 |
| May... | 102.3 | 114.1 | 147.5 | 187.0 | 165.5 | May... | 98.6 | 113.6 | 168.5 | 282.0 | 278.0 |
| June... | 102.3 | 114.3 | 143.5 | 183.5 | 167.5 | June... | 97.9 | 112.9 | 173.0 | 284.5 | 283.5 |
| July... | 102.0 | 115.7 | 155.5 | 195.0 | 177.5 | July... | 98.1 | 113.0 | 173.0 | 285.0 | 281.0 |
| Aug... | 102.0 | 115.9 | 156.5 | 210.5 | 190.5 | Aug... | 98.1 | 112.9 | 181.0 | 280.5 | 285.0 |
| Sept... | 102.0 | 116.0 | 162.0 | 230.0 | 203.0 | Sept... | 97.4 | 112.2 | 169.5 | 281.5 | 282.0 |
| Oct... | 103.1 | 116.6 | 169.0 | 250.0 | 217.5 | Oct... | 98.1 | 111.9 | 174.5 | 301.5 | 289.5 |
| Nov... | 103.1 | 117.0 | 176.5 | 267.5 | 229.5 | Nov... | 98.6 | 111.2 | 178.5 | 283.5 | 288.5 |
| Dec... | 103.4 | 117.2 | 178.0 | 266.0 | 230.5 | Dec... | 97.6 | 111.2 | 172.0 | 295.5 | 295.5 |

different varieties of cotton sheeting.¹³ Table XIII carries out the comparison between the relative prices of bonds and stocks by months.¹⁴ It is preceded by a summary, Table XII, in which the monthly figures are averaged, as in Table IX, according to the successive phases of the business cycles which have run their course in America since 1890.

The following are the chief differences shown by these tables between the fluctuations in the prices of bonds, stocks, and commodities: (1) With the exception of the erratic series for United States 4's, bonds are steadier in price—showing higher minima in 1890-99 and lower maxima in 1900-1909. (2) Bonds rise, while stocks and commodities fall, in the periods of depression following the crises of 1893 and 1907. (3) Bonds reach their highest levels in 1901-2, while stocks and commodities mount still higher in 1906, 1907, or 1909. (4) While the level upon which bonds fluctuate is somewhat higher in the second decade than in the first, there is no such marked contrast as in the case of stocks. (5) At the end of the period, bond prices show trifling losses or moderate gains in comparison with 1890, while all the series for stocks show large gains. The index number for commodities, however, marks a less advance than the average for bonds.

The greater steadiness of bond prices requires little comment. Dividends vary, interest is fixed. The ten bonds of these tables have paid the same average return of 4.06 per cent upon their par value every year since 1890, while the average dividends upon the ten dividend-paying stocks included in Table XI have varied as follows:

¹³ This series is described in a recent note in the *Quarterly Journal of Economics* (November, 1910)—“The Dun-Gibson Index Number.” It is nearly, but not quite, identical with the series published last May in this Journal, p. 373.

¹⁴ The average relative prices of ten railway bonds in Table X are arithmetic means of the corresponding figures for each of the ten bonds. A trial showed that substantially the same results are obtained by dividing the average yields of all the bonds in 1890-99 by their average yield for each year. Since the latter method of computation is far less laborious, I have adopted it in working out the monthly figures of Table XIII. The discrepancies, produced by this difference in method, between the figures of Table X and the annual averages which may be struck from the figures of Table XIII are negligible.

The data for stocks are means between the highest and lowest monthly figures presented in the previous articles. See this Journal, XVIII, 350-67, 517-19.

| Per cent | Per cent | Per cent | Per cent |
|---------------|---------------|---------------|---------------|
| 1890.....6.45 | 1895.....5.88 | 1900.....5.95 | 1905.....7.00 |
| 1891.....6.40 | 1896.....5.90 | 1901.....6.30 | 1906.....7.10 |
| 1892.....6.53 | 1897.....5.38 | 1902.....6.90 | 1907.....7.70 |
| 1893.....6.50 | 1898.....5.60 | 1903.....6.90 | 1908.....7.63 |
| 1894.....6.35 | 1899.....5.60 | 1904.....6.90 | 1909.....7.60 |

Moreover, the owners of many high-priced stocks have derived a considerable irregular gain in addition to dividends from the privileges accorded them from time to time of subscribing for new issues of stock on highly profitable terms.¹⁵ Upon the other stocks included in the table dividends, when paid at all, have been much more variable. Even among the ten preferred stocks only three have yielded dividends every year.¹⁶ The general situation is best shown by Table XIV, which compares the amounts per mile of line paid by the interstate railways as interest upon funded debt, and as dividends.¹⁷ The broad differences between the relatively stable interest payments and the highly variable dividend disbursements go far toward accounting for the differences between the courses pursued by the prices of bonds and of stocks.

On a purely investment basis, therefore, stocks should fluctuate more violently than bonds. In addition, considerations other than those of an investor intent upon income and safety are a more potent factor in the stock than in the bond market. Speculation, manipulation, contests for control, etc.—all the transactions which produce fluctuations not warranted by changes in the incomes yielded by securities—are primarily phenomena of the stock exchange, and touch the bond market but indirectly. In proportion as stocks become firmly established as “dividend-payers,” however, their prices come increasingly under the control of investment considerations and approximate more closely the steadiness of bond prices. It is for this reason that

¹⁵ Compare T. W. Mitchell, “Stockholders’ Profits from Privileged Subscriptions,” *Quarterly Journal of Economics* (February, 1905).

¹⁶ See the July article, Table VI, p. 522.

¹⁷ Compiled from the statistical reports of the Interstate Commerce Commission. Certain changes in the plan of accounting impair somewhat comparisons between the data for income in 1908-9 and in earlier years. But the commission’s report for 1908 states that the “main figures” of the income account are comparable (p. 86). I have rearranged the figures for the last two years to make them correspond as nearly as possible with those for 1890-1907.

TABLE XIV
ACTUAL AND RELATIVE NET INCOME, DIVIDENDS, AND INTEREST ON FUNDED DEBT
OF THE INTERSTATE RAILWAYS, PER MILE OF LINE
By Years Ending June 30, 1890-1909

| Years Ending June 30 | ACTUAL AMOUNTS | | | RELATIVE AMOUNTS Av. ACTUAL AMOUNTS 1890-99 = 100 | | |
|----------------------------|----------------------------------|-----------|------------|--|-----------|------------|
| | Interest on Funded Debt | Dividends | Net Income | Interest on Funded Debt | Dividends | Net Income |
| 1890..... | \$1,416 | \$ 574 | \$ 651 | 101 | 104 | 110 |
| 1891..... | 1,361 | 598 | 682 | 97 | 108 | 115 |
| 1892..... | 1,478 | 628 | 714 | 106 | 113 | 121 |
| 1893..... | 1,474 | 606 | 654 | 105 | 109 | 111 |
| 1894..... | 1,439 | 578 | 317 | 103 | 105 | 54 |
| 1895..... | 1,420 | 484 | 316 | 102 | 87 | 54 |
| 1896..... | 1,371 | 484 | 492 | 98 | 87 | 83 |
| 1897..... | 1,352 | 477 | 444 | 97 | 86 | 75 |
| 1898..... | 1,333 | 521 | 760 | 95 | 94 | 120 |
| 1899..... | 1,339 | 592 | 875 | 96 | 107 | 148 |
| 1900..... | 1,313 | 725 | 1,180 | 94 | 131 | 200 |
| 1901..... | 1,340 | 802 | 1,235 | 96 | 145 | 209 |
| 1902..... | 1,371 | 926 | 1,400 | 98 | 167 | 237 |
| 1903..... | 1,383 | 960 | 1,443 | 99 | 173 | 244 |
| 1904..... | 1,403 | 1,046 | 1,313 | 100 | 189 | 222 |
| 1905..... | 1,431 | 1,097 | 1,507 | 102 | 198 | 255 |
| 1906..... | 1,451 | 1,227 | 1,732 | 104 | 221 | 293 |
| 1907..... | 1,513 | 1,355 | 1,976 | 108 | 245 | 335 |
| 1908..... | 1,616 | 1,718 | 1,729 | 116 | 310 | 293 |
| 1909..... | 1,639 | 1,377 | 1,696 | 117 | 248 | 287 |

preferred stocks fluctuate less than common stocks, and mainly for this reason that the ten dividend-paying stocks in Table XI fluctuate less than the ten preferred.

The failure of bonds to match stocks in attaining a much higher level of prices in the second decade is a particular aspect of the general difference in stability, which merits especial attention. The salient facts upon which an explanation must proceed are brought out by Table XIV.

The fiscal years 1893-97 were disastrous to American railways. The table shows the loss of nearly half the net income of 1892, the cutting of dividends, and the slow reduction of interest charges. Common stocks bore the brunt of these bad years and fell heavily in price. Preferred stocks, though less affected than common, fell more than commodities at wholesale. Even the

strongest dividend-paying stocks dropped from 105 in 1892 to 92 in 1896.¹⁸ But bonds, while falling during the crisis, promptly rose during the years of depression to prices higher than had prevailed in the prosperous months of 1891-92. For investors, frightened by the panic and discouraged by hard times, were in a mood to value more highly than before the relative security of bonds. And this willingness to pay higher prices for relative security more than offset the increased risk which attached to the bonds themselves, owing to the weakened position of railway finances.

With the return of prosperity in the summer of 1897, the whole situation changed. The net income of railways was more than trebled between the years ending June 30, 1897 and 1902. Dividends were raised on the stocks which had paid them regularly in the worst of years; dividends were renewed on other stocks, and dividends were gradually begun on many issues which had never paid a dollar. But the railway directors did not distribute all of their increased profits among stockholders. They carried liberal sums over to restore surpluses impaired by the period of hard times, and devoted part of their earnings to bettering the physical condition of properties which had run down. At the same time, they took advantage of the improvement in their credit and of the favorable rates of interest to sell new issues of bonds, and spent the proceeds largely in increasing their equipment. The result of this policy was to enhance the capacity of the railways for handling traffic and to reduce the cost per unit. Increased profits abundantly rewarded these efforts. Even after reduction to a mileage basis, the net incomes of the railways from 1901-9 were never less than double the average net incomes of 1890-99.

Just as common stocks were most affected by the years of depression, so they were most affected by the years of prosperity. The profits of the railways doubled, and so did the prices of common stocks—though the increase of dividends was less rapid than the increase of net income. But preferred stocks, most of which confer but a limited right to participate in increased divi-

¹⁸ Annual averages of relative prices. See Table XI.

dends, rose considerably less than common stocks. Yet more moderate was the rise of the few stocks which had paid dividends even in the middle nineties. Most moderate of all was the rise of bonds. The increased financial strength of the railways gave the holders of bonds secured by prior liens a wider margin of safety, and therefore advanced the price of bonds to a somewhat higher level. But the bondholders made no other gains. On the contrary, the alluring prospects of profits in the rising stock market tempted bondholders to convert their bonds into stocks. Further, the keen competition among borrowing corporations gave investors an opportunity to exact better terms, and the increasing cost of living spurred them to make the most of their opportunity. Hence the marked contrast between the relative prices of bonds and of stocks in 1900-1909.

Another difference between the relative prices of bonds and stocks which requires comment is their course in periods of prosperity, crisis, and depression. Table XII shows the facts succinctly.

From the standpoint of profit and loss upon resale, bonds have been the better investments in periods of crisis and depression, and stocks in periods of revival and prosperity. Barring the peculiar series for United States 4's, the tables show no exception to the statements that bonds fall less than stocks during crises, and rise less during prosperity.¹⁹ But the common statement that during periods of depression bonds rise while stocks fall requires qualification. Bonds did not rise during the dull months January-July, 1891, and stocks did rise during the dull months January-September, 1908. The truth is that stocks, like all goods for which we have detailed data, react from the extremely low points touched during a severe crisis. But, if the crisis is succeeded by a long period of depression, stock prices sag again, and may, as in 1895, 1896, and 1897, touch lower figures than those of the crisis itself. Bonds, on the contrary,

¹⁹ An apparent anomaly in Table XII is that the average prices of all classes of securities stand higher in the minor crisis of October to December, 1899, than in the preceding period of prosperity. But the monthly figures of Table XIII show that there was a decline during the period of stress from the level attained toward the close of the prosperous months.

rise during a long period of depression, unless circumstances are such as to cast doubt upon the ability of corporations to pay their interest coupons. Low-grade bonds affected by such doubts fall at the same time that high-grade bonds are rising. But Table X shows that in 1894 and again in 1908 only one bond in the present list fell below its average price during the preceding year of crisis—the bond of the Chicago, Milwaukee & St. Paul in the first case and of the Wabash in the second. Further, a comparison between Tables X and II shows that the bonds in highest credit rose less in price during these years of depression than several of the other securities. Investors who had been frightened out of the stock market did not insist upon having the very best of bonds; but sought rather for issues which appeared safe, and at the same time yielded $\frac{1}{4}$ – $\frac{1}{2}$ per cent more upon the investment than did the bonds guaranteed by the New York Central.

V. INTERNATIONAL COMPARISONS

For comparison with the American tables of net yields upon investments in bonds, no foreign material is readily available save with reference to government securities. Of course, British consols, French rentes, and imperial German bonds are ultra conservative investments, and yield exceptionally low rates of interest. Moreover, both the supply of, and the demand for, these securities is subject in a special degree to certain conditions not arising from the business situation—such as prospects of war and peace, increase of government expenditures, purchases for government savings banks or sinking funds, changes in the list of securities legally open to investment by trustees, actual or prospective alterations in tax laws, and the like. These peculiar conditions may cause changes in the yields upon government bonds which are not representative of the general trend of the investment market. But until some student, with the full European material at his command, shall have provided adequate tables of the net yields upon investments in the bonds of business enterprises, changes in the yields of government securities will remain the safest guide to alterations in the long-time rates

of interest.²⁰ They are certainly a safer guide than the corresponding American figures would be;²¹ for during the period considered there has been no such doubt regarding the medium in which the obligations of Great Britain, France, and Germany would be discharged as was raised by the free-silver agitation of the nineties, and removed by the Gold Standard Act of 1900. Moreover, the European markets for government bonds are not dominated by any one erratic factor to the same degree that the American market is dominated by the purchases and sales of national banks. Indeed, so exceptional has been the course of government bonds in this country that it is wiser to base the international comparisons upon the net yields of the West Shore Railroad's securities than upon the net yields of United States 4's.

The actual yields of European securities are taken from a table showing the "real interest earned upon European . . . government bonds at their average market price," published in Andrew's *Statistics for the United States*.²² But the net yield of British consols in 1903, the year in which the rate of interest was reduced from $2\frac{3}{4}$ to $2\frac{1}{2}$ per cent, is from A. H. Gibson's *The Fall in Consols*.²³ The relative rates of interest and the relative prices of bonds have been computed by the methods explained above. The average actual yields in 1890-99 are 2.763 per cent upon United States 4's, 3.827 per cent upon West Shore

²⁰ Upon foreign rates of interest see A. H. Gibson, *The Fall in Consols and Other Investments since 1897* (London, 1908); P. L. Newman, "A Review of the Investments of Offices in Recent Years," *Journal of the Institute of Actuaries*, XLII, 294-320; F. Hawkar, "Note sur les variations du taux de l'intérêt en Belgique," *Proceedings of the Fourth International Congress of Actuaries* (New York, 1904), I, 345-50; G. Robert, *Des variations du taux de l'intérêt* (Lyon, 1902); E. Voye, "Ueber die Höhe der verschiedenen Zinsarten," *Sammlung nationalökonomischer und statistischer Abhandlungen des staatswissenschaftlichen Seminars zu Halle* (Jena, 1902); N. E. Weill, *Die Solidarität der Geldmärkte* (Frankfurt a. M., 1903); H. Albert, *Die geschichtliche Entwicklung des Zinsfußes in Deutschland von 1895 bis 1908* (Leipzig, 1910). These books contain much statistical information, but none in such form as to be strictly comparable with the American tables of the present paper.

²¹ Albert, *op. cit.*, 42-52, shows that in Germany the fluctuations of interest upon mortgage loans follow closely the fluctuations of net yields upon government bonds during the years 1895-1908.

²² One of the reports of the National Monetary Commission (Senate Document, No. 570, 61st Cong., 2d sess., p. 281). In turn, Andrew took his foreign data from the *Materialien zur Beurteilung der Zusammenhänge zwischen dem öffentlichen Schuldenwesen und dem Kapitalmarkt* (Berlin, 1908).

²³ London, 1908; p. 54.

bonds, 2.673 per cent upon consols, 3.042 per cent upon rentes, and 3.281 per cent upon German 3's. These are the rates which equal 100 in the columns for relative yields in Table XV, and these rates divided by the yields for each year give the relative prices of bonds in Table XVI.

TABLE XV

ACTUAL AND RELATIVE RATES OF INTEREST YIELDED BY INVESTMENTS IN BONDS OF THE WEST SHORE RAILROAD, AND OF THE AMERICAN, BRITISH, FRENCH, AND GERMAN GOVERNMENTS

| | ACTUAL RATES | | | | | RELATIVE RATES AVERAGE ACTUAL RATES 1890-99=100 | | | | |
|-----------|---------------------------------------|-----------------------|--|-----------------------------------|---------------|--|-----------------------|--|-----------------------------------|---------------|
| | U.S. 4's of 1907 and 1925 | West Shore R.R. | English Consols 2½ and 2½ per cent | French Rentes 3 per cent | German 3's | U.S. 4's of 1907 and 1925 | West Shore R.R. | English Consols 2½ and 2½ per cent | French Rentes 3 per cent | German 3's |
| 1890..... | 2.43 | 3.88 | 2.86 | 3.32 | 3.45 | 88 | 101 | 107 | 109 | 105 |
| 1891..... | 2.65 | 3.96 | 2.88 | 3.19 | 3.52 | 96 | 103 | 108 | 105 | 107 |
| 1892..... | 2.80 | 3.90 | 2.85 | 3.09 | 3.48 | 101 | 102 | 107 | 102 | 106 |
| 1893..... | 3.04 | 4.02 | 2.81 | 3.10 | 3.48 | 110 | 105 | 105 | 102 | 106 |
| 1894..... | 2.79 | 3.87 | 2.73 | 3.01 | 3.31 | 101 | 101 | 102 | 99 | 101 |
| 1895..... | 2.89 | 3.82 | 2.60 | 2.95 | 3.03 | 105 | 100 | 97 | 97 | 92 |
| 1896..... | 3.14 | 3.85 | 2.49 | 2.95 | 3.02 | 114 | 101 | 93 | 97 | 92 |
| 1897..... | 2.73 | 3.72 | 2.45 | 2.91 | 3.07 | 99 | 97 | 92 | 96 | 94 |
| 1898..... | 2.69 | 3.69 | 2.49 | 2.93 | 3.14 | 97 | 96 | 93 | 96 | 96 |
| 1899..... | 2.47 | 3.56 | 2.57 | 2.97 | 3.31 | 89 | 93 | 96 | 98 | 101 |
| 1900..... | 2.18 | 3.57 | 2.77 | 2.99 | 3.46 | 79 | 93 | 104 | 98 | 105 |
| 1901..... | 1.97 | 3.54 | 2.93 | 2.98 | 3.36 | 71 | 93 | 110 | 98 | 102 |
| 1902..... | 1.98 | 3.55 | 2.92 | 2.99 | 3.25 | 72 | 93 | 109 | 98 | 99 |
| 1903..... | 1.99 | 3.70 | 2.82 | 3.07 | 3.28 | 72 | 97 | 105 | 101 | 100 |
| 1904..... | 2.09 | 3.72 | 2.84 | 3.09 | 3.33 | 76 | 97 | 106 | 102 | 101 |
| 1905..... | 2.00 | 3.70 | 2.79 | 3.04 | 3.33 | 72 | 97 | 104 | 100 | 101 |
| 1906..... | 2.04 | 3.80 | 2.84 | 3.08 | 3.42 | 74 | 99 | 106 | 101 | 104 |
| 1907..... | 2.18 | 3.97 | 2.98 | 3.18 | 3.57 | 79 | 104 | 111 | 105 | 109 |
| 1908..... | 2.44 | 3.95 | 2.91 | 3.13 | 3.62 | 88 | 103 | 109 | 103 | 110 |
| 1909..... | 2.52 | 3.89 | 2.98 | 3.09 | 3.54 | 91 | 102 | 111 | 102 | 108 |

If the whole period of twenty years be taken, the United States bonds give the lowest average yields. Then in order come the securities of Great Britain, France, Germany, and the West Shore Railroad. The margin between the government bonds which give the lowest and highest yields is the same in 1909 as in 1890. Between these two years the American, British, and German bonds have lost ground, while French rentes have gained.

In respect to the price fluctuations which the bonds have undergone from year to year, the three European series are rather like each other and decidedly different from the American series. The year 1891 was one of "undigested securities" in Europe, not unlike 1903-4 in the United States. A vast mass of stocks and bonds, which European investors had bought during the hopeful years 1888-90 from promoters and underwriters at home and abroad, weighed heavily upon the market after the disaster of Barings in November, 1890. To protect these doubtful holdings many over-loaded firms and individuals were forced to sell their gilt-edged securities, not only in London and Berlin, but also in New York. Hence the decline in the price of bonds shown by Table XVI in 1891. Rentes escaped the decline, because French investors, sobered by the collapse of the copper ring, the *Comptoir d'Escompte*, and the Panama Canal Company early in 1889, had taken less share in speculative ventures.

TABLE XVI

RELATIVE PRICES OF BONDS OF THE WEST SHORE RAILROAD AND OF THE AMERICAN,
BRITISH, FRENCH, AND GERMAN GOVERNMENTS
BY YEARS, 1890-1909

| | UNITED STATES | | GREAT BRITAIN CONSOLS 2½ AND 2½ PER CENT | FRANCE, RENTES 3 PER CENT | GERMANY, IMPERIAL 3 PER CENT |
|-----------|------------------------------|--------------------|--|---------------------------------|------------------------------------|
| | U.S. 4's of 1907 and 1925 | West Shore R.R. | | | |
| 1890..... | 114 | 99 | 93 | 92 | 95 |
| 1891..... | 104 | 97 | 93 | 95 | 93 |
| 1892..... | 99 | 98 | 94 | 98 | 94 |
| 1893..... | 91 | 95 | 95 | 98 | 94 |
| 1894..... | 99 | 99 | 98 | 101 | 99 |
| 1895..... | 96 | 100 | 103 | 103 | 108 |
| 1896..... | 88 | 99 | 107 | 103 | 109 |
| 1897..... | 101 | 103 | 109 | 105 | 107 |
| 1898..... | 103 | 104 | 107 | 104 | 104 |
| 1899..... | 112 | 107 | 104 | 102 | 99 |
| 1900..... | 127 | 107 | 97 | 102 | 95 |
| 1901..... | 140 | 108 | 91 | 102 | 98 |
| 1902..... | 140 | 108 | 92 | 102 | 101 |
| 1903..... | 139 | 103 | 95 | 99 | 100 |
| 1904..... | 132 | 103 | 94 | 98 | 99 |
| 1905..... | 138 | 103 | 96 | 100 | 99 |
| 1906..... | 135 | 101 | 94 | 99 | 96 |
| 1907..... | 127 | 96 | 90 | 96 | 92 |
| 1908..... | 113 | 97 | 92 | 97 | 91 |
| 1909..... | 110 | 98 | 90 | 98 | 93 |

During the dull years which followed, European investors became as timid as they had been bold, and sought security above all things. The result was a fairly steady rise of high-grade bonds in England, France, and Germany until 1896 or 1897. In America the course of affairs was very different, because of the panic of 1893 and the agitation for free coinage of silver—disturbing factors of which Europe felt but a moderate reflex influence.

After the depression, business activity began to revive somewhat earlier on the other side of the Atlantic—in 1896 or even in 1895, instead of in the summer of 1897. Confidence returned with prosperity and investors began to show preference for securities which promised higher returns than government bonds. Hence the latter declined in price and their net yields rose gradually until 1900–1901. But American investors, with the panic of 1893, and the set-back of 1896 still fresh in mind, kept on buying high-grade bonds freely until 1901–2.

The crisis of 1900 was more serious in Europe than here. It again disposed investors to seek safety, and bond prices turned upward—vigorously in Germany, where the crisis was most severe, mildly in France and England. The highest points reached, however, were much below the records of 1896–97. The movements of 1903–5 were irregular and slight—save that United States 4's declined heavily in 1904. But after 1905 the renewed prosperity brought renewed neglect of bonds, and prices fell rapidly until 1907. This time the American trend harmonized with the European. The difficulties experienced in financing large enterprises in New York had their counterparts in London, Paris, and Berlin. After the crisis, bond prices rose again; but the yearly averages for United States and German bonds were less in 1908 than in 1907. In the last year, the French, German, and West Shore bonds rose slightly, while consols and United States 4's fell.

The chief differences between the trend of the bond market in this country and abroad, then, are the interruption of the rise of prices in America by the panic of 1893 and the free-silver campaign of 1896, and the rise of American bonds in 1897–1901,

while European bonds were falling. This rise of American bonds under conditions of marked prosperity, such as usually dispose investors to seek investments of a more lucrative character, is the most surprising result of the whole investigation. So far as United States 4's are concerned the settlement of all doubts about the medium in which the obligations would be paid, and the increasing demand for bonds as a basis of national bank circulation, provide an adequate explanation. The Gold Standard Act may also have improved the rating of the West Shore bonds, which are not expressly payable in gold; but it will be recalled that these bonds were not greatly affected by the free-silver agitation, save in the summer of 1896. More influence was exercised by the notable increase in the financial strength of American railways, to which attention has been directed. Directly, the West Shore bonds were less affected by this factor than the issues of roads which had been in straits during the years of depression. But an increase in the prices of so large a group of securities as the bonds of other railways must have reacted upon the price of any single issue; for the prices of all high-grade bonds are intimately related to each other through the tie of substitution goods.

European statistics of discount rates are distinctly more complete and more authoritative than the corresponding American figures. It is sufficient to say that the material used consists of the bank rates and market rates in London, Paris, and Berlin. The bank rates are obtained from Palgrave's tables, as published in the National Monetary Commission's *Statistics for Great Britain, Germany, and France*.²⁴ The market rates for London and Paris are annual averages of the weekly rates given in the same document.²⁵ The Berlin market rates are compiled from the *Statistische Jahrbücher für das Deutsche Reich*. The closest American counterpart to the foreign rates is afforded by the series for double-name commercial paper, running 60-90 days.

²⁴ Senate Document, No. 578, 61st Cong., 2d sess., pp. 134, 137, 140.

²⁵ Pp. 44-62, 315, 316. Among the several London rates I have chosen that for 60-day bills.

TABLE XVII

ACTUAL AND RELATIVE DISCOUNT RATES ON SHORT-TIME LOANS IN
NEW YORK, LONDON, PARIS, AND BERLIN
BY YEARS, 1890-1909

ACTUAL RATES

| | New York 60-90 Days | London Bank Rate | Paris Bank Rate | Berlin Bank Rate | New York 60-90 Days | London Market Rate | Paris Market Rate | Berlin Market Rate |
|---------|---------------------------|------------------------|-----------------------|------------------------|---------------------------|--------------------------|-------------------------|--------------------------|
| 1890... | 5.64 | 4.52 | 3.00 | 4.52 | 5.64 | 3.98* | 2.62 | 3.78 |
| 1891... | 5.41 | 3.26 | 3.00 | 3.79 | 5.41 | 2.44 | 2.53 | 3.02 |
| 1892... | 4.04 | 2.53 | 2.70 | 3.21 | 4.04 | 1.47 | 1.79 | 1.80 |
| 1893... | 6.86 | 3.05 | 2.50 | 4.07 | 6.86 | 2.13 | 2.22 | 3.17 |
| 1894... | 3.04 | 2.11 | 2.50 | 3.13 | 3.04 | .97 | 1.78 | 1.74 |
| 1895... | 3.64 | 2.00 | 2.10 | 3.14 | 3.64 | .80 | 1.63 | 2.01 |
| 1896... | 5.76 | 2.48 | 2.00 | 3.67 | 5.76 | 1.47 | 1.72 | 3.04 |
| 1897... | 3.57 | 2.63 | 2.00 | 3.81 | 3.57 | 1.81 | 1.81 | 3.09 |
| 1898... | 3.82 | 3.24 | 2.20 | 4.27 | 3.82 | 2.58 | 1.99 | 3.55 |
| 1899... | 4.05 | 3.75 | 3.06 | 5.04 | 4.05 | 3.24 | 2.83 | 4.45 |
| 1900... | 4.38 | 3.98 | 3.24 | 5.33 | 4.38 | 3.64 | 3.03 | 4.41 |
| 1901... | 4.24 | 3.72 | 3.00 | 4.10 | 4.24 | 3.19 | 2.41 | 3.06 |
| 1902... | 4.88 | 3.33 | 3.00 | 3.33 | 4.88 | 2.97 | 2.40 | 2.19 |
| 1903... | 5.43 | 3.75 | 3.00 | 3.84 | 5.43 | 3.38 | 2.70 | 3.01 |
| 1904... | 4.24 | 3.30 | 3.00 | 4.23 | 4.24 | 2.67 | 2.14 | 3.14 |
| 1905... | 4.35 | 3.00 | 3.00 | 3.81 | 4.35 | 2.64 | 2.11 | 2.85 |
| 1906... | 5.68 | 4.26 | 3.00 | 5.15 | 5.68 | 4.06 | 2.69 | 4.04 |
| 1907... | 6.27 | 4.92 | 3.46 | 6.03 | 6.27 | 4.47 | 3.36 | 5.12 |
| 1908... | 4.42 | 3.02 | 3.05 | 4.78 | 4.42 | 2.24 | 2.13 | 3.52 |
| 1909... | 3.86 | 3.10 | 3.00 | 3.93 | 3.86 | | | 2.87 |

RELATIVE RATES

Average Actual Rates 1890-99 = 100

| | | | | | | | | |
|---------|-----|-----|-----|-----|-----|-------|-------|-----|
| 1890... | 123 | 153 | 120 | 117 | 123 | 191* | 125 | 127 |
| 1891... | 118 | 110 | 120 | 98 | 118 | 117 | 121 | 102 |
| 1892... | 88 | 86 | 108 | 83 | 88 | 70 | 86 | 61 |
| 1893... | 150 | 103 | 100 | 105 | 150 | 102 | 106 | 107 |
| 1894... | 66 | 71 | 100 | 81 | 66 | 46 | 85 | 59 |
| 1895... | 79 | 68 | 84 | 81 | 79 | 38 | 78 | 68 |
| 1896... | 126 | 84 | 80 | 95 | 126 | 70 | 82 | 103 |
| 1897... | 78 | 89 | 80 | 99 | 78 | 87 | 87 | 104 |
| 1898... | 83 | 110 | 88 | 110 | 83 | 124 | 95 | 120 |
| 1899... | 88 | 127 | 122 | 130 | 88 | 155 | 135 | 150 |
| 1900... | 96 | 135 | 129 | 138 | 96 | 174 | 145 | 149 |
| 1901... | 93 | 126 | 120 | 160 | 93 | 153 | 115 | 103 |
| 1902... | 106 | 113 | 120 | 86 | 106 | 142 | 115 | 74 |
| 1903... | 118 | 127 | 120 | 99 | 118 | 162 | 129 | 102 |
| 1904... | 93 | 112 | 120 | 109 | 93 | 128 | 102 | 106 |
| 1905... | 95 | 101 | 120 | 99 | 95 | 126 | 101 | 96 |
| 1906... | 124 | 144 | 120 | 133 | 124 | 194 | 129 | 136 |
| 1907... | 137 | 166 | 138 | 156 | 137 | 214 | 161 | 173 |
| 1908... | 96 | 102 | 122 | 124 | 96 | 107 | 102 | 119 |
| 1909... | 84 | 105 | 120 | 102 | 84 | | | 97 |

* May 16 to end of the year—33 weeks.

Comparisons between the actual rates are unsatisfactory because of the uncertainty regarding the technical character of the paper discounted in the several markets. But it may be pointed out (1) that the annual averages of foreign bank rates are always higher than the corresponding market rates, (2) that for the whole period both bank rates and market rates are lower in Paris than in London, and lower in London than in Berlin, (3) that the advantage of Paris over London has become greater since 1898, (4) that the New York rates are higher than even the bank rates in Europe, except in 1897-1900 and 1908-9, when they are exceeded by the rates in Berlin.

A comparison between the foreign rates on short-time loans and on government bonds shows that the latter average less than the bank rates and more than the market rates, except in France, where the yields upon rentes are higher even than the bank rates for the whole period, though not for the second decade. But the difference in stability is more striking and more important than the difference in average rates. The relative figures of Tables XV and XVII show that market rates fluctuate much more than bank rates, and bank rates much more than bond rates.

On the whole, however, the general trend of the fluctuations has been similar in the money and the investment markets. The most important differences are that short-time rates relaxed in 1891, while bond rates stiffened; that short-time rates rose in 1893, while bond rates changed but little; and that short-time rates rose more promptly after the years of depression and reached their highest points earlier in the years of prosperity. All the rates show a higher level of fluctuation in 1900-1909 than 1890-99—though the difference in the case of French rentes is small.

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